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Head Office :
• Ghazni Street, Urdu Bazaar
Lahore. Ph: 37314319

Quality Control Dept.
• 257-Riwaz Garden
Lahore. Ph: 37213318

Lahore Outlet :
• 2-Al-Kareem Market
Urdu Bazaar. Ph: 37220879

Rawalpindi : Iqbal Road, Committee Chowk. Ph: 051-5539609
Faisalabad : Kotwali Road, Near Ameenpur Bazaar. Ph: 041-2627568
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PREFACE

Competing for the post of a lecturer is always a hard nut to crack, it requires comprehensive and in depth knowledge of the subject. The procedure for the recruitment of lecturers has changed. The aptitude and mental capability of the candidates will be evaluated by Multiple Choice Questions (MCQs). The quintessence of this procedure is that only those candidates will be triumphant who have studied Physics meticulously and methodically. Keeping in view the exam pattern and the subtleties of the subject, we have collected a large number of MCQs on Physics, selected almost from all facets, in a book form.

In Physics (*for Lecturer & Subject Specialist*), the questions have been divided into various sets. The answers are provided at the end of each set. A deep study of the book will surely enable you to be successful and in fulfilling your dreams. The book is compiled in such a way that the students, making preparation even in a short time, may get through the examination.

We have tried our level best to make this treatise flawless and free of errors of omission or commission. However, if you find any deficiency or mistake, we expect you to point it out and give your valuable suggestions for the betterment of this work. All of your suggestions and opinions are the lodestar for us.

We are extremely indebted to the directors of Jahangir Books, Mr Nabeel Niaz, Mr Fawaz Niaz and Mr Adeel Niaz, for their extraordinary help and support for immediate publishing of the book.

We appreciate and admire the dynamic and valuable contributions of Mr. Muhammad Sheraz, Mr. Muhammad Usman Butt, Mr. Nisar Ali, Mr. Zohaib Ahmed and other fellows as without their help this endeavour would not have been possible.

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MCQs ON PRINCIPLES OF TEACHING

TEACHING METHODS MCQS

1. **_____ is the most important quality of a teacher at primary level.**
   (a) Eagerness to teach (b) Patience and perseverance
   (c) Knowledge of subjects (d) None of these
2. **A psychologist using the method of naturalistic observation would_____.**
   (a) Carefully design controlled situations in which to observe behaviour
   (b) Rely on observations of subjects' responses to questionnaires
   (c) Observe behaviour as it happens outside the laboratory or clinic
   (d) None of these
3. **A teacher believes that one group of children is very bright and that a second is below average in ability. Actually, the groups are identical, but the first group progresses more rapidly than the second. This demonstrates _____.**
   (a) The self-fulfilling prophecy
   (b) The Placebo effect in a natural experiment
   (c) Observer bias in naturalistic observation
   (d) None of these
4. **____ is a sign of motivated teaching.**
   (a) Maximum attendance in the class
   (b) Remedial work given by the teacher
   (c) Questioning by students (d) None of these
5. **Research findings suggest that one of the ways effective teachers can increase learning time and, more importantly, student engagement during learning is _____.**
   (a) Maintain a quiet classroom where students can concentrate and work undisturbed
   (b) Provide tangible rewards for work well done, such as free reading time, passes to the library, or extra credit
   (c) Ensure that assignments are interesting, worthwhile, and easy enough to be completed by each learner at his or her current level of understanding
   (d) None of these
6. **____ is least likely to promote achievement among students of lower socioeconomic status.**
   (a) Warm classroom climate
   (b) Frequent correction of wrong answers
   (c) Peer and cross-age tutors (d) None of these

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(c) Kohlberg (d) None of these

17. _____ is not related to the socio-psychological needs of the child.
(a) Need for appreciation or social approval
(b) Need for emotional security
(c) Regular elimination of waste products from the body
(d) None of these

18. All of the following statements can be considered as a feature of the process of learning except _____.
(a) Educational institutions are the only place where learning takes place
(b) Learning is a comprehensive process
(c) Learning is goal-oriented (d) None of these

19. The stage in which a child begins to think logically about objects and events is called _____.
(a) Sensori-motor stage (b) Formal operational stage
(c) Pre-operational stage (d) None of these

20. Learning can be enriched if_____.
(a) Situations from the real world are brought into the class in which students interact with each other and the teacher facilitates
(b) More and more teaching aids are used in the class
(c) Teachers use different types of lectures and explanation
(d) None of these

21. A student of V-grade with 'visual deficiency' should be_____.
(a) Excused to do a lower level of work
(b) Helped with higher routine-work by parents and friends
(c) Treated normally in the classroom and provided support through Audio CDs
(d) None of these

22. _____ identified the four distinct stages of children's intellectual development.
(a) Kohlberg (b) Erikson
(c) Piaget (d) None of these

23. Education of children with special needs should be provided ____.
(a) Along with the normal children
(b) By methods developed for special children in special Schools
(c) In special school (d) None of these

24. A girl does not talk much at home but talks a lot at school. It shows that_____.
(a) The school provides opportunities to children to talk a lot
(b) Her thoughts get acknowledged at school
(c) She does not like her home at all
(d) None of these

25. "A young child responds to a new situation on the basis of the response made by him/her in a similar situation as in the past." This is related to_____.
(a) 'Law of Analogy' of learning (b) 'Law of Effect' of learning
(c) 'Law of Attitude' of learning process

7. To make assessment a 'useful and interesting' process, one should be careful about _____.
(a) Making comparisons between different students
(b) Labelling students as intelligent or average learners
(c) Using a variety of ways' to collect information about the student's learning across the scholastic and co-scholastic boundaries
(d) None of these

8. 'Dyslexia' is a _____.
(a) Mental disorder (b) Mathematical disorder
(c) Reading disorder (b) None of these

9. Parents should play a _____ role in the learning process of young children.
(a) Negative (b) Proactive
(c) Sympathetic (d) None of these

10. The student _____does not manifest a sign of an intelligent young child.
(a) Who has the ability to cram long essays very quickly
(b) Who has the ability to communicate fluently and appropriately
(c) Who carries on thinking in an abstract manner
(d) None of these

11. The child's 'cognitive' development is defined in the best way in ___.
(a) Playground
(b) School and classroom environment
(c) Home (d) None of these

12. In the field of education, the term 'curriculum' refers to_____.
(a) Methods of teaching and the content to be taught
(b) Overall programme of the school which students experience on a day-to-day basis
(c) Evaluation process (d) None of these

13. "Development is a never-ending process." This idea is associated with_____.
(a) Principle of interrelation (b) Principle of continuity
(c) Principle of integration (d) None of these

14. The 'insight theory of learning' was augmented by_____.
(a) 'Gestalt' theorists (b) Pavlov
(c) Jean Piaget (d) None of these

15. A teacher allows students to sit all over the class. Some sit together and discuss or do group reading. Some sit quietly, and read themselves. A parent does not like it. The best way to handle the situation is that the parents should_____.
(a) Complain against the teacher to the principal
(b) Request the principal to change the section of their ward
(c) Show trust in the teacher and discuss the problem with the teacher
(d) None of these

16. "Children actively construct their understanding of the world" is a statement attributed to _____.
(a) Piaget (b) Pavlov

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(d) None of these

26. **In _____ children become active members of their peer group.**
(a) Adolescence (b) Adulthood
(c) Early childhood (d) None of these

27. **_____ is not a sign of 'being gifted'.**
(a) Creative ideas (b) Fighting with others
(c) Novelty in expression (d) None of these

28. **_____ is related to the objective that a teacher should make an attempt to understand the potentialities of students.**
(a) Educational Sociology (b) Social Philosophy
(c) Educational Psychology (d) None of these

29. **Motivation, in the process of learning _____.**
(a) Sharpens the memory of learners
(b) Differentiates new learning from the old one
(c) Creates interest for learning among young learners
(d) None of these

30. **In an experiment to find out if taking ginseng increases IQ scores, the IQ scores would be**
(a) The dependent variable (b) A control variable
(c) An extraneous variable (d) None of these

31. **A major strength of ecological theory is its framework for explaining_____.**
(a) Environmental influences on development
(b) Biological influences on development.
(c) Cognitive development. (d) None of these

32. **All of the following advanced principles of child development that are closely allied to the stimulus response learning theory, except___.**
(a) Pavlov (b) Gesell
(c) J. B. Watson (d) None of these

33. **The process whereby the genetic factors limit an individual's responsiveness to the environment is known as_____.**
(a) Canalization (b) Discontinuity
(c) Range of reaction (d) None of these

34. **In order to develop the spirit of labour in students the teacher should _____.**
(a) Himself indulge in labour
(b) Deliver lectures on the importance of labour
(c) Students should be given opportunities to do labour from time to time
(d) None of these

35. **A child belonging to a backward family has been admitted to your school from the cultural viewpoint. You will**
(a) Keep him in a class in which, there are many more students of backward background from the cultural viewpoint
(b) Send a teacher to know more about the backward cultural background of the child

(c) Keep him in a normal class but will make special arrangements for teaching him, keeping his special needs in view
(d) None of these

36. **All of the following can be signs that a child is gifted, except_____.**
(a) Early development of a sense of time
(b) Interest in encyclopaedias and dictionaries
(c) Uneasy relationships with peers
(d) None of these

37. **Frobel's most important contribution to education was his development of the _____.**
(a) Vocational school (b) Public high school
(c) Kindergarten (d) None of these

38. **Of the following, the main purpose of state certification of teachers is to_____.**
(a) Monitor the quality of teacher training institutions
(b) Provide for a uniform standard of entry-level teacher competency throughout the state
(c) Exclude from the profession those not trained in pedagogy
(d) None of these

39. **The key difference between evolutionary and cultural change is that evolutionary change alters _____ whereas cultural change alters _____.**
(a) Reproduction; environment (b) Heredity; environment
(c) Environment; behaviour (d) None of these

40. **The current view of childhood assumes that_____.**
(a) Children are similar to adults in most ways
(b) Children are best treated as young adults
(c) Childhood is a unique period of growth and change
(d) None of these

41. **In preparing a fifth grade class to take a standardized reading test the teacher is best advised to _____.**
(a) Tell the children the test is very important and they should do the best they can
(b) Ditto key questions from a previous test and allow the pupils to answer them
(c) Give the pupils practice in answering questions similar to the type that will appear on the test
(d) None of these

42. **A normal child of twelve years of age is most likely to _____.**
(a) Have difficulty with gross motor coordination
(b) Be eager for peer approval
(c) Confine his/her interests to here and now
(d) None of these

43. **Creative writing should be an activity planned for_____.**
(a) Only those children reading on grade level
(b) Only those children who can spell and also, can write cohesive sentences

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(c) Only those children who want to write for the newspaper of the class
(d) All of the above

44. The most promising step for a teacher to take in order to improve class discipline is to _____.
(a) Note specific infractions of class rules in the marking book
(b) Evaluate his/her materials, methods and approaches to children
(c) Consult the class and agree upon a graduated series of punishments
(d) None of these

45. The question "Will the shy child who never speaks turn into a quiet, shy adult or will the child become a sociable, talkative person?" is concerned with _____.
(a) Maturation (b) Continuity and discontinuity
(c) Nature and nurture (d) None of these

46. A child from a disorganised home will experience the greatest difficulty with_____.
(a) Well structured lessons (b) Independent study
(c) Programmed instruction (d) None of these

47. Most psychologists believe that development is due_____.
(a) Largely to nature (b) Largely to nurture
(c) To an interaction of nature and nurture
(d) None of these

48. The normal twelve-year-old child is most likely to_____.
(a) Be eager for peer approval
(b) Have anxiety feelings about pleasing adults
(c) Confine his/her interests to the here and now
(d) None of these

49. The reason why students run from school is
(a) Callous attitude of teachers towards the problem
(b) Lack of interest in studies on the part of students
(c) Not giving punishment to students
(d) None of these

50. You find a student to be intelligent. You will_____.
(a) Remain pleased with him
(b) Not give him additional homework
(c) Motivate him so that he can make more progress
(d) None of these

51. If some students are not in a mood to study in the class, you will _____.
(a) Force them to study
(b) Tell those students to leave the class and enjoy
(c) Tell them some interesting things related to their interests or your own subject (d) None of these

52. Child development is defined as a field of study that_____.
(a) Examines change in human abilities.
(b) Seeks to explain behaviour across the life span.

(c) Accounts for the gradual evolution of the child's cognitive, social, and other capacities (d) None of these

53. The term 'identical elements' is closely associated with_____.
(a) Group instruction (b) Transfer of learning
(c) Jealousy between twins (d) None of these

54. A person believes that nurture strongly influences the development of his child. He would not agree with the importance of___.
(a) Genetic factors (b) Exposure to peers
(c) The types of toys at home (d) None of these

55. If student is too shy to participate in the class, you will_____.
(a) Not ask questions from him
(b) Ask only those questions from him whose answers can be given by him
(c) Ask questions from him only when he is keen to answer them
(d) None of these

56. A good teacher will bring a hyperactive child on the right path by _____.
(a) Making him sit in front of the class and keep a strict vigil on him
(b) Allocating a seat for him in a corner of the class
(c) Giving him tasks of watering trees, cleaning the blackboard, making toys of clay, etc. (d) None of these

57. Knowledge of child psychology is a must for a primary teacher because_____.
(a) It helps in making children disciplined
(b) The examination result is improved
(c) It helps the teacher in understanding the behaviour of children
(d) None of these

58. The movement of behaviour modification, wherein tokens are awarded for correct responses, is a reflection of_____.
(a) Herbart's Five Steps (b) Lock's Tabula rasa
(c) Thorndike's Law of Effect (d) None of these

59. Subjects are said to be assigned randomly when_____.
(a) They are assigned to experimental and control groups from a sample which is representative of the larger population.
(b) They each have an equal chance of being assigned to either the experimental or control group.
(c) Neither the experimenter nor the subject knows whether the subject is in the experimental or control group.
(d) None of these

60. Students who do better in high school tend to do better in college. This is an example of a_____ correlation
(a) Negative (b) Zero
(c) Positive (d) None of these

61. Fifteen-years-old Ahsan wears the same style shirts that his teacher wears. This is called _____ behaviour.
(a) Compensation (b) Transference
(c) Identification (d) None of these

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62. **At least one third of the learning that will determine later levels of school achievement has already taken place by age six. This was said by _____.**
(a) Benjamin Bloom (b) Margaret Mead
(c) Martin Mayer (d) None of these

63. **_____ is the he most unreliable predictor of educational achievement.**
(a) Inherited biological potential for learning
(b) Ethnic origin of parents
(c) Family background and training
(d) None of these

64. **_____ is not an acceptable goal for dealing with behaviour problems in the classroom.**
(a) Utilizing appeals to children that have personal implications
(b) Being impersonal and objective
(c) Understanding the offense (d) None of these

65. **In preparing a class to take a standardized reading test the teacher should_____.**
(a) Tell the children the test is very important and they should do the best they can
(b) Ditto key questions from a previous test and allow the pupils to answer them
(c) Give the pupils practice in answering questions similar to the type that will appear on the test
(d) None of these

66. **_____ is likely to cause the greatest difficulty for a child in the initial stages of reading instruction.**
(a) Confusion of left and right directionality
(b) Possessing an IQ of 90
(c) Having older siblings who are successful readers
(d) None of these

67. **An essential of learning called _____ is the one that takes procedure over the other.**
(a) Desire to learn (b) Ability to read
(c) An intact home (d) None of these

68. **A child from a disorganized home will experience the greatest difficulty with_____.**
(a) Well structured lessons (b) Independent study
(c) Programmed instruction (d) None of these

69. **The normal twelve-year-old child is most likely to_____.**
(a) Have difficulty with gross motor coordination
(b) Have anxiety feelings about pleasing adults
(c) Be eager for peer approval (d) None of these

70. **The term 'identical elements' is closely associated with_____.**
(a) Group instruction (b) Transfer of learning
(c) Jealousy between twins (d) None of these

71. **The peculiar characteristic of first grade children is that they are_____.**
(a) Too young to be taught classroom routines
(b) Not yet concerned with group approval
(c) Very concerned with adult approval
(d) None of these

72. **The evaluation of personality is best made through the use of an_____.**
(a) Inventory test (b) Projective test
(c) Survey test (d) None of these

73. **When a pupil's misbehaviour persists even after the teacher punishes the child for each infraction, the teacher is probably practicing a policy of_____.**
(a) Retribution (b) Corporal punishment
(c) Negative reinforcement (d) None of these

74. **Ayaz and Asad have the same mental age 8.0. We can conclude that_____.**
(a) They have the same potential for success in school.
(b) They have the same IQ
(c) Their ability to learn may be quite different
(d) None of these

75. **A child whose class is in a windowless room may have to be assigned to another class if he/she suffers from_____.**
(a) Acrophobia (b) Agoraphobia
(c) Claustrophobia (d) None of these

76. **The self-adjective mechanism that teachers often unwittingly encourage is_____.**
(a) An attention-getting device (b) Daydreaming
(c) Regression (d) None of these

77. **When an individual repeats those learning that, in the past, proved to be highly satisfying, such behaviour can best be explained by the law of_____.**
(a) Effect (b) Frequency
(c) Readiness (d) None of these

78. **Children's attitudes toward persons of different ethnic groups are generally based upon _____.**
(a) Their parent's attitudes (b) The attitudes of their peer
(c) The influence of television (d) None of these

79. **_____ is not a sound mental hygiene practice.**
(a) Asking pupils to correct their answers after their tests have been marked
(b) Discussing an individual pupil's test marks with the class
(c) Asking parents to sign test papers so that that they are aware of their child's marks. (d) None of these

80. **All of the following advanced principles of child development are closely allied to the stimulus response learning theory, except ___.**
(a) Pavlov (b) J. B. Watson

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(c) Gesell (d) None of these

81. All of the following can be signs that a child is gifted, except____.
(a) Early development of a sense of time
(b) Interest in encyclopaedias and dictionaries
(c) Uneasy relationships with peers.
(d) None of these

82. Teacher tenure laws can best be justified because they_____.
(a) Protect teachers whose political views differ sharply with those of the community
(b) Provide for stability of staffing
(c) Allow an experienced teacher to plan creatively
(d) None of these

83. All of the following contribute to the crisis in urban schools except__.
(a) The rapid increase in school pollution
(b) The disappearance of taxable property
(c) The deterioration and decline of real property
(d) None of these

84. Which is the incorrectly associated pair?
(a) Joseph Lancaster-contract plan
(b) Benjamin Franklin-academy
(c) James B. Conant-high school
(d) None of these

85. When parents ask teachers about their children's television habits, it is best to suggest that they_____.
(a) Prohibit television viewing
(b) Use television for rewards and punishments
(c) Give children freedom to selected whatever they want to see
(d) None of these

86. Curriculum-makers have the most difficulty when_____.
(a) There is an inflationary cycle
(b) The nature of the student population is changing
(c) Parents are participants (d) None of these

87. A major contribution of the Jesuits to education includes all of the following except_____.
(a) Insistence on well trained teachers
(b) Repetition and memorization as teaching methods
(c) Concentration on the early education of children
(d) None of these

88. De facto school segregation is segregation primarily a result of___.
(a) Guidelines issued by the State Commissioner of Education
(b) Discriminatory zoning of a local school board
(c) Residence patterns of the community
(d) None of these

89. _____ advanced the idea of the five formal steps in leaving.
(a) Rousseau (b) Herbart
(c) Pestalozzi (d) None of these

90. That the mind of an infant is a *tabula rasa* is the contribution of___.
(a) Plato (b) Horace Man
(c) John Locke (d) None of these

91. The disadvantaged child's chances for success in school will be maximized when_____.
(a) he/she is given a high concentration of skills subjects
(b) His/her intellectual potential is discovered and his/her educational deficiencies are overcome
(c) He/she is treated like any other child
(d) None of these

92. "The individual develops through the head, the heart, and the hand", this was the educational philosophy of_____.
(a) Herbart (b) Comenius
(c) Pestalozzi (d) None of these

93. Of the following the statement the least educationally valid is____.
(a) Over-learning constitutes a waste of time
(b) Drill periods should be brief
(c) Study habits should be taught
(d) None of these

94. In a kindergarten class it would be unreasonable to expect a child to_____.
(a) Care for plants (b) Clean up after clay work
(c) Know when it is time to clean up
(d) None of these

95. The trial and error method of instruction is best enhanced by____.
(a) Role playing (b) Programmed instruction
(c) Independent study (d) None of these

96. A parent of a fourth grader refuses to give permission for her child to go on a class trip. The teacher should first_____.
(a) Refer the matter to the guidance counsellor
(b) Confer with the parent to discuss the educational purpose of the trip
(c) Give the class a homework assignment for all parents to sign, giving reasons why each child wants to go on the trip
(d) None of these

97. An increase in comprehension skill is most likely to result from___.
(a) Guided silent reading (b) Guided oral reading
(c) Unstructured silent reading (d) None of these

98. In dealing with a class that is misbehaving, the teacher's least effective course of action is to_____.
(a) Ask the principal to observe him/her and make recommendations
(b) Lower the grades of pupils who create the most serious infractions
(c) Isolate those most responsible for the misbehaviour
(d) None of these

99. A fourth grader takes the possessions of pupils who sit near him. The teacher's best initial step is to_____.
(a) Isolate the child in a corner of the room

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(b) Arrange a parent conference to try to determine causation
(c) Ignore the behaviour, as it will eventually disappear
(d) None of these

100. **All of the following are appropriate areas for pupil-teacher planning except_____.**
(a) The day's schedule (b) The selection of committees
(c) The sequence in a skills programme
(d) None of these

ANSWERS

1.	b	2.	c	3.	a	4.	c	5.	c
6.	b	7.	c	8.	c	9.	b	10.	a
11.	b	12.	b	13.	b	14.	a	15.	c
16.	a	17.	c	18.	a	19.	d	20.	a
21.	c	22.	c	23.	a	24.	b	25.	b
26.	a	27.	b	28.	c	29.	c	30.	c
31.	a	32.	b	33.	c	34.	c	35.	c
36	c	37	c	38	b	39	b	40	c
41	c	42	b	43	c	44	b	45	c
46	b	47	c	48	a	49	a	50	c
51	c	52	c	53	b	54	a	55	c
56	c	57	c	58	c	59	b	60	c
61	c	62	a	63	b	64	d	65	c
66	a	67	a	68	b	69	c	70	b
71	a	72	b	73	c	74	c	75	c
76	a	77	a	78	a	79	b	80	d
81	c	82	a	83	a	84	a	85	c
86	b	87	d	88	c	89	b	90	c
91	b	92	c	93	a	94	d	95	d
96	b	97	a	98	b	99	b	100	c

TEACHING TECHNIQUES MCQS

1. **All of the following are examples of intrinsic motivation except**
(a) Encouraging pupils to help develop the aim of a lesson
(b) Permitting pupils to evaluate each other's answers
(c) Utilizing pupils backgrounds and experiences
(d) None of these

2. **The most important objective of committee work is to have children _____.**
(a) Practice parliamentary procedure
(b) Develop the leadership skills of the high achievers
(c) Develop skills of cooperative learning and problem solving
(d) None of these

3. **All of the following statements about children are correct except that_____.**
(a) Older children in elementary schools are less prone to illness than younger children
(b) Many children do not eat proper breakfasts
(c) Girls are superior to boys of the same age in mathematical abilities
(d) None of these

4. **All of the following are descriptive of good teaching except that ___.**
(a) Creative methods can used to achieve traditional goals
(b) Teachers may fail to achieve satisfactory adjustment of some children despite use of optimum procedures
(c) Teachers should refer all children with emotional problems to the guidance counselior
(d) None of these

5. **A sixth-grade class includes a group of children reading on the fourth-grade level. Of the following, the best material to use with this group is a _____.**
(a) Fourth-grade basal reader
(b) Tape recorder
(c) High interest, low level book of stories
(d) None of these

6. **A child who frequently loses his/her place where reading can be temporarily helped by _____.**
(a) Allowing him/her to finger-point
(b) Giving him/her a card to place under each line being read
(c) Providing him/her with a large-print reader such as those used by the visually handicapped
(d) None of these

7. **Of the following activities in a science class, the one with least educational value is_____.**
(a) Viewing a filmstrip (b) Constructing a model
(c) Reading about a simple experiment
(d) None of these

8. **The operation of the class library should be the responsibility of_____.**
(a) Rotating committees of pupils
(b) Volunteer parents
(c) The children who contributed the books
(d) None of these

9. **Group tests that have norms for each grade and that that are administered in accordance with uniform procedures listed in a manual of instruction are called_____.**
(a) School-wide finales (b) Quizzes
(c) Standardized tests (d) None of these

10. **In comparing the lecture and developmental lessons, all of the following are true except that_____.**
(a) There is more pupil activity in the developmental lesson

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(b) Slow children drive more benefit from a lecture than brighter children
(c) The lecture method is more conducive to larger classes
(d) None of these

11. A teacher notes poor attendance in class on the day when weekly tests are given. The teacher should _____.
(a) Call the parents of the absentees
(b) Schedule tests throughout the week
(c) Do nothing (d) None of these

12. When the majority of pupils in a science class are well below grade level in reading, the teacher should _____.
(a) Read to the class from the text book
(b) Plan many hands-on activities
(c) Show many filmstrips (d) None of these

13. Career education should begin_____.
(a) In kindergarten (b) In the third or fourth grades
(c) When the child enters junior high school
(d) None of these

14. Of the following birds of advice given by an experienced teacher to a new colleague, it would be best to ignore the one that state____.
(a) If you have a very shy child, don't call on the child, wait until the child volunteers
(b) When a child misbehaves, first look for the reaction
(c) Ask many "how" and "Why" questions and not too many "what and who questions
(d) None of these

15. To be successful with an overactive child, the teacher should____.
(a) Give the child extra written work so he/she will have a reason for remaining in his/her seat
(b) Allow the child to leave his/her seat whenever he/she becomes restless
(c) Provide the child with purposeful activities that legitimize the need for movement
(d) None of these

16. The teacher of a class with a sizeable number of Spaniards notices that the Spaniards and the other children form two separate groups on the school playground. The teacher is best advised to___.
(a) Ignore the situation
(b) Suggest that the principal organize a separate class of Spaniards
(c) Organize those playground games that promote co-mingling
(d) None of these

17. A class assembly programme best contributes to educational goals when it_____.
(a) Presents a well known children's play written by a talented author
(b) Features the best singers or actors in the class
(c) Is praised by parents as being "just like a Broadway show"
(d) None of these

18. When planning to develop the powers of creative thinking, the teacher should allow for all of the following experience except___.
(d) Solving of all problems through use of a well practiced formula
(b) Failure of an experiment in science
(c) Inability to locate a book in the school library
(d) None of these

19. All of the following are applicable in good motivation except that it should be_____.
(a) Be brief (b) From the teacher
(c) Related to the lesson that follows
(d) None of these

20. Of the following statements above slow learners and bright children, the correct one is that_____.
(a) Both groups strive for success in school
(b) Slow learners are likely to have greater manual dexterity
(c) Slow learners are likely to be physically stronger
(d) None of these

21. A small school assigns a class teacher to several hours of school library management. Of the following, the teacher's top priority should be to make sure that_____.
(a) The library is used appropriately by maximum number of children
(b) Only books that are popular with the children are ordered
(c) The card catalogue is in order
(d) None of these

22. During a conference, the mother of the third grader asks the teacher how she can help improve her child's reading ability. Of the following the poorest recommendation is that she should___.
(a) Encourage the child to make regular visits to the public library
(b) Severely limit the child watching of television
(c) Take the child on trips to interesting places in the community
(d) None of these

23. Creative writing should be an activity planned for_____.
(a) Only those children reading on grade level
(b) Only those children who want to write for the class newspaper
(c) All children
(d) None of these

24. Of the following possible procedure to procure to follow after the class has taken a spelling test, the teacher should not_____.
(a) Permit pupils to discuss the answers
(b) Correct the paper of the pupils who failed to finish the test
(c) Assign a drill to the entire class based on the most frequently misspelled words
(d) None of these

25. Of the following, the one least important to success in beginning reading is_____.
(a) Knowledge of the alphabet (b) Normal vision and hearing
(c) Directionality (d) None of these

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26. **Lesson planning should be guided primary by the consideration of_____.**
(a) Meeting the needs of the average child in the class
(b) Creating a happy classroom environment
(c) The curriculum goals
(d) None of these

27. **The best procedure for a teacher to adopt with a pupil who frequently stammers in class is to_____.**
(a) Afford the child ample opportunity to recite to the class
(b) Suggest that the parents seek professional help
(c) Suggest that the parents apply of home instruction
(d) None of these

28. **Of the following, the most promising step for a teacher to take in order to improve class discipline is to_____.**
(a) Note specific infractions for class rules in the marking book
(b) Evaluate his/her material, methods, and approaches toe children
(c) Consult the class and agree upon a graduated series of punishments
(d) None of these

29. **A small machine used in the reading programme to increase rate of speed is the _____.**
(a) Mnemonic device (b) Sphygmomanometer
(c) Tachistoscope (d) None of these

30. **A teacher should be catechized for all of the following practices except _____.**
(a) Undermining the role of the parent
(b) Becoming overly friendly with pupils
(c) Exercising firm leadership (d) None of these

31. **Team teaching is chartered by all of the following except_____.**
(a) The use of master teacher (b) Inflexible groupings
(c) Group planning (d) None of these

32. **A paraprofessional may properly engage in all of the following activities expect_____.**
(a) Assisting on parents night
(b) Conferring with parents about a child behaviour
(c) Making short answer tests
(d) None of these

33. **The teacher introduces a problem-solving lesson with a good motivation and then asks for proposed solutions. No suggestions are forthcoming. The teacher is best advised to_____.**
(a) Stimulate pupil thought by advancing a few personal proposals
(b) Tell the student to read their text
(c) Show an interesting filmstrip (d) None of these

34. **Individual differences within a class are best handled by_____.**
(a) Coaching slow children after school
(b) Giving the bright students free reading time
(c) Organizing groups for specific purposes

(d) None of these

35. **A quite, reserved fourth grader brings roadmaps to school and looks at them whenever he gets a chance. The teacher should ____.**
(a) Encourage the pupil to talk about them during a show and tell period
(b) Tell the pupil the leave the maps at home
(c) Take the maps away (d) None of these

36. **The tightly structured lesson that is taught with little flexibility is least conductive to the learning of the student who _____.**
(a) Is culturally disadvantaged (b) Is hyperactive
(c) Has a 125 IQ (d) None of these

37. **The discovery method of teaching is best exemplified by_____.**
(a) Play activities (b) Rote learning
(c) Independent study projects (d) None of these

38. **The best procedure for a teacher to follow when a pupil habitually calls out in class is to_____.**
(a) Ask for a percent conference
(b) Put a demerit in the making book on each occasion
(c) Call on the pupil to answer questions that are within his/her ability level
(d) None of these

39. **Akmal tells her teacher that three other girls, who the teacher knows are Akmal's friends, copy from each other on all the tests. Of the following the teacher is best advised to first_____.**
(a) Give the three girls a zero on the last two tests
(b) Confer with Akmal's mother
(c) Try to understand why Akmal said this
(d) None of these

40. **Most educators agree that oral reading_____.**
(a) Comes naturally to good readers
(b) Is do difficult to do well that it is waste of time to teach it
(c) Requires an audience situation
(d) None of these

41. **After a lesson is taught the teacher's lesson plan should be_____.**
(a) Sent to the supervisor for evaluation
(b) Annotated
(c) Filed for use by a substitute teacher
(d) None of these

42. **Of the following, the least appropriate opening day activity is_____.**
(a) Saluting the flag (b) Assigning homework
(c) Outlining the day's schedule (d) None of these

43. **The discovery method of learning is best exemplified by_____.**
(a) Programmed instruction (b) Experimentation in a science laboratory
(c) Team teaching (d) None of these

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44. **You find that in your class, a group of students are not obeying you. You will _____.**
(a) Avoid the students (b) Punish them
(c) Speak and convince them (d) None of these

45. **You have a brilliant student who is very good at studies but not taking part in curricular activities. You will _____.**
(a) Convince him by counselling
(b) Avoid him
(c) Inform parents/Principal (d) None of these

46. **In your class you came to know that the mother of one student is expired. You will _____.**
(a) Behave in a way that you are not aware of anything
(b) Speak with that student about his mother
(c) Try to make that student normal in class.
(d) None of these

47. **In the class you come to know that a student wants to work part time to give his school fees. You will _____.**
(a) Pay his school fees
(b) By collecting donation from others
(c) Make him understand about the consequences and inform his parents.
(d) None of these

48. **On a school education trip, a student gets hurt. You will _____.**
(a) After first aid send him back to school
(b) Inform the parents and Principal and take him to nearest hospital
(c) Shout for help from others (d) None of these

49. **As a class teacher, you will tackle the regularly late coming students by _____.**
(a) Punishing them (b) Avoiding them
(c) Consulting them and their parents
(d) None of these

50. **You will behave in class on extra arrangement by being_____.**
(a) Lenient (b) Very strict
(c) Engaging them in some activity
(d) None of these

51. **Your relations with other teacher should be_____.**
(a) Friendly (b) Cordial
(c) Only official communication (d) None of these

52. **You can improve the students who are weak in studies through__.**
(a) Counselling & remedial classes
(b) Punishment
(c) Make their fun in class (d) None of these

53. **If a student is good at sports but not interested in studies, you will_____.**
(a) Advise him to leave the sports (b) Inform his parents
(c) Encourage him and convince about importance of education
(d) None of these

54. **The motto of the teacher is to_____.**
(a) Teach subject matter (b) Maintain discipline
(c) Guide student's growth (d) None of these

55. **You find that a child has a high fever in your class. You will____.**
(a) Give him medicine from first aid box.
(b) Send him to hospital with assistant and inform his parents.
(c) Avoid him (d) None of these

56. **Parents of a child inform you that their child is not interested in one subject. You will _____.**
(a) Inform the principal
(b) Suggest the parents to arrange tuition.
(c) Discuss among parents, subject teacher and convince the child.
(d) None of these

57. **As a teacher your duty towards weak students is to _____.**
(a) Avoid them
(b) Inform their parents and principal
(c) Take remedial classes and solve their problems
(d) None of these

58. **As newly-appointed teacher your first evolution will be to_____.**
(a) Ascertain and follow the procedures followed earlier
(b) Bring new reform by changing the curriculum
(c) Cooperate with fellow teachers / parents
(d) None of these

59. **The most important function of the teacher is to _____.**
(a) Teach subject matter (b) Maintain discipline
(c) Guide student's growth (d) None of these

60. **_____ is not a product of learning.**
(a) Maturity level. (b) Skills
(c) Attitude (d) None of these

61. **A high school survey showed modern teachers are _____.**
(a) More friendly to children (b) Conservative in approach
(c) Guide students' growth (d) None of these

62. **Teaching is called a noble profession because _____.**
(a) All teachers are noble having good qualities
(b) It is a type of service provided to the society
(c) Students give noble feedback
(d) None of these

63. **The first professional capability you should meet as a new teacher is to _____.**
(a) Seek guidance from senior teachers
(b) Bring new reform by changing the curriculum
(c) Ascertain and follow the procedures followed earlier
(d) None of these

64. **One will have more chances of being successful as a teacher, if___.**
(d) He can organise his teaching material systematically and conveys the same effectively
(b) He is-trained in teaching

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(c) He has ethical values and a good character
(d) None of these

65. **Effective teaching is a function of_____.**
(d) Clear and precise communication
(b) Perfect classroom discipline
(c) Regular teaching (d) None of these

66. **_____ is the most desirable for a teacher.**
(d) To be punctual in the class
(b) Clear, precise and systematic presentation
(c) To be strict disciplinarian (d) None of these

67. **_____is the most important for a teacher.**
(d) Classroom discipline (b) Subject he is teaching
(c) Students of the class (d) None of these

68. **Requisite of a good teacher is fulfilled by one who _____.**
(d) Reads a lot (b) Publishes lots of research paper
(c) Teaches well (d) None of these

69. **A teacher is successful only if he_____.**
(d) Knows his subject thoroughly well
(b) Produces cent per cent result
(c) Is approachable (d) None of these

70. **_____ is the best process of communication for controlling noise in a classroom.**
(d) Saying 'don't talk'
(b) Raising one's voice above students voice
(c) Remaining calm and just looking at students
(d) None of these

71. **Failure of the teacher to communicate his ideals well to the student's may result in to_____.**
(d) Classroom indiscipline.
(b) Loss of student's interest in the topic being taught
(c) Increased number of absentees in the class
(d) All of the above

72. **Good teaching is a function of_____.**
(d) Sincerity and devotion to the profession of teaching
(b) High academic qualification of the teachers
(c) Principal's powerful leadership in the college
(d) None of these

73. **All of the following statements are true except _____.**
(d) A good communicator cannot be a good teacher
(b) A good communicator has good sense of humour
(c) A good communicator has wide reading
(d) A good communicator has command over language

74. **An effective communication does not require_____.**
(d) Changes in speech pattern (b) Appropriate gestures
(c) Handsome personality (d) None of these

75. **The most important challenge before a teacher is to _____.**
(d) Maintain discipline in the classroom

(b) Make students do their home work
(c) Make teaching learning process enjoyable
(d) None of these

76. **The competency of a teacher can be judged on the basis of_____.**
(d) Publication of books (b) Length of service
(c) Meeting needs of students (d) None of these

77. **A competent teacher is one who can_____.**
(d) Help all students to pass the examination
(b) Create interests in the subject amongst the students
(c) Maintain silence ill the classroom
(d) None of these

78. **The most powerful barrier of communication in the classroom is_____.**
(d) Noise in the classroom
(b) Confusion on the part of the teacher
(c) More outside disturbance in the class room
(d) None of these

79. **An ideal teacher _____.**
(d) Is highly intelligent (b) Lives simple life
(c) Has genuine interest in his students
(d) None of these

80. **The group of communication aspects that does not distort the communication process in the class is _____.**
(d) Reversing—evaluating—focussing
(b) Evaluating—focussing—illustrating
(c) Focussing—illustrating—exaggerating
(d) None of these

81. **A teacher who _____ will be liked the most by students.**
(d) Loves to teach (b) Is of highly idealist philosophy
(c) Often amuses his students (d) None of these

82. **A successful communicator is the one who _____.**
(d) Presents material in a precise and clear way
(b) Is able to adopt himself according to the language of the communicate
(c) Knows a lot but is somewhat reserve in his attitude
(d) None of these

83. **You will like the teacher most who uses _____.**
(d) Board occasionally (b) Chart and maps
(c) Film projector along with the proper use of the board
(d) None of these

84. **Which of the following should a teacher adopt in his lecture?**
(d) Precise and low tone (b) Elongated tone
(c) Precise and high tone (d) None of these

85. **A new teacher to start with will have to_____.**
(d) Enforce discipline in the class
(b) Establish rapport with the students
(c) Cut Jokes with the students (d) None of these

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86. **An effective teacher shall ensure_____.**
(d) Cooperation among his students
(b) Laissez-faire role
(c) Competition or cooperation as the situation demands
(d) None of these

87. **_____ will not hamper effective communication in the class.**
(d) A lengthy statement (b) An ambiguous statement
(c) A precise statement (d) None of these

88. **The best way to establish rapport with you class is to _____.**
(a) Be discipline and strict in your class
(b) Be a friend to your students
(c) Impress you students with knowledge and teaching skills
(d) None of these

89. **The development of a person's character is done by_____.**
(a) Society (b) Family
(c) Family and society together (d) None of these

90. **Teaching comes under the classification of work namely_____.**
(a) Service (b) Skilled
(c) Clerical (d) None of these

91. **Supervision of children is the responsibility of _____.**
(a) The principal (b) All teachers
(c) Only class teacher (d) None of these

92. **The teacher's lack of mental health is shown to students by the constant _____.**
(a) Punishment the curriculum (b) Nagging
(c) Shouting (d) None of these

93. **Emotional Adjustment of students is effective in_____.**
(a) Personality formation (b) Class-teaching
(c) Discipline (d) All of the above

94. **Blackboard can be included is a _____ teaching-aid.**
(a) Audio-aid (b) Visual-aid
(c) Audio-visual aid (d) None of these

95. **_____ is/are related with teaching skills.**
(a) Black-board writing (b) Solving questions
(c) Asking questions (d) All of the above

96. **Students who ask questions in the class should be_____.**
(a) Advised to meet the teacher after the class
(b) Encouraged to participate in the discussion in the class
(c) Encouraged to continue asking questions
(d) None of these

97. **At authoritarian level teaching is_____.**
(a) Teacher-centred (b) Child-centred
(c) Principal-centred (d) Experience based

98. **The interaction analysis category system in education for increasing the teacher effectiveness was developed by_____.**
(a) Flander (b) Rayon
(c) Amidon and Simon (d) Richard Over

99. **One of the important theories of moral development has been proposed by_____.**
(a) Laurence Kohlberg (b) Erik Fromm
(c) Daniel Coleman (d) Benjamin Bloom

100. **Character is developed by_____.**
(a) Will-power (b) Conduct and behaviour
(c) Morality (d) All of the above

ANSWERS

1.	b	2.	c	3.	c	4	c	5.	c
6.	b	7.	c	8.	a	9.	c	10.	b
11.	b	12.	b	13.	a	14.	a	15.	c
16.	c	17.	c	18.	a	19.	b	20.	a
21.	a	22.	b	23.	c	24.	c	25.	a
26.	c	27.	b	28.	b	29.	c	30.	c
31.	b	32.	b	33.	a	34.	d	35.	a
36.	c	37.	c	38.	c	39.	c	40.	c
41.	a	42.	b	43.	b	44.	c	45.	a
46.	c	47.	c	48.	b	49.	c	50.	c
51.	b	52.	a	53.	c	54.	c	55.	b
56.	c	57.	d	58.	a	59.	c	60.	a
61.	c	62.	b	63.	d	64.	a	65.	a
66.	c	67.	c	68.	c	69.	a	70.	c
71.	d	72.	a	73.	a	74.	c	75.	d
76.	a	77.	b	78.	b	79.	c	80.	c
81.	a	82.	c	83.	c	84.	a	85.	b
86.	c	87.	c	88.	c	89.	c	90.	a
91.	a	92.	a	93.	d	94.	b	95.	d
96.	c	97.	a	98.	a	99.	a	100.	d

TEACHING APTITUDE MCQS

1. **_____is not a level of teaching learning.**
(a) Differentiation level (b) Memory level
(c) Reflective level (d) None of these

2. **The Father of Psychoanalysis is_____.**
(a) Sigmund Freud (b) Jean Piaget
(c) Jerome S. Bruner (d) None of these

3. **In pedagogy computer is used to _____.**
(a) Motivate the learner (b) Provide feedback
(c) Interact with the learner (d) All of the above

4. **Spare the rod – spoil the child. This assumption is related to that type of discipline which has been advocated by _____.**
(a) Naturalist philosophy (b) Pragmatist philosophy

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(c) Victorian Era philosophers (d) None of these

5. **The proponent of the Cognitive Theory of teaching is_____.**
   (a) N. L. Gage (b) Jerome S. Bruner
   (c) B. F. Skinner (d) None of these
6. **The determinant of teaching skill training is_____.**
   (a) Components (b) Pupil-teacher
   (c) Supervisor (d) None of these
7. **For a good communication _____ is required.**
   (a) Clarity of thought (b) Speaking without pause
   (c) Speaking in a mild tone (d) None of these
8. **_____ is an approach to educational planning.**
   (a) Manpower approach (b) Social Demand approach
   (c) Both a & b (d) None of these
9. **Institutional planning should be based on_____.**
   (a) Aims and needs (b) Time-table
   (c) Administration (d) None of these
10. **Teacher behaviour ought to be _____.**
    (a) Administrative (b) Instructive
    (c) Idealistic (d) None of these
11. **Information highway or net is_____.**
    (a) Computer (b) Internet
    (c) Intranet (d) None of these
12. **Students should expect to _____ from group learning.**
    (a) Get appreciation from the group
    (b) Distribute the work equally
    (c) Attract isolated student towards the group
    (d) None of these
13. **In order to modify the undesirable behaviour of a student the most effective method is_____.**
    (a) To punish the student
    (b) To bring it to the notice of parents
    (c) To find out the reasons for the undesirable behaviour and provide remedies
    (d) None of these
14. **Main responsibility of School Management lies on_____.**
    (a) Principal (b) Teachers
    (c) Manager (d) None of these
15. **Major objective of School Discipline is _____.**
    (a) To ensure safety of staff and students
    (b) To create an environment conducive for teaching
    (c) Both (a) and (b) (d) None of these
16. **Practical knowledge of language is learnt at—**
    (a) School (b) Language laboratory
    (c) Language teaching (d) None of these
17. **Dropping out from school means _____.**
    (a) To come to school casually (b) To leave the school forever
    (c) To play truant from class (d) None of these

18. **_____ is not a principle of a good time table.**
    (a) Flexibility (b) Ruthless master
    (c) Variety (d) None of these
19. **The reason of absence and escape from school is_____.**
    (a) Lack of interest in syllabus (b) Poor method of teaching
    (c) Ineffective teacher (d) All of the above
20. **_____ can be taken as a reflection of meaningful learning.**
    (a) A good score in the examination
    (b) A high degree of retention
    (c) The capability of transfer-ring/ using learning in different situations
    (d) None of these
21. **The most important thing for a student to gain a better insight in the subject is / are _____.**
    (a) The notes given by the subject teacher in the class
    (b) The discussion facilitated by the teacher and held by the students for comprehending various aspects of the topic under reference
    (c) The source material arranged by the teacher for the students
    (d) None of these
22. **Schools should arrange co-curricular activities for the students, because _____.**
    (a) Curricular experiences are incomplete without supplements
    (b) Interplay of curricular and co-curricular experiences gives a better insight into the content and its context
    (c) Everybody wants co-curricular activities these days
    (d) None of these
23. **You are teaching in your class and it is almost the end of your session. A child of your class comes late and seeks your permission to enter the class. You will _____.**
    (a) Not permit the child, as it makes little sense coming to class so late
    (b) Get annoyed, as you are disturbed
    (c) Allow him/her to enter and ask him/her the reasons for being so late when the class gets over (d) None of these
24. **You enter your regular class to discover the children not in a mood to study that particular day. You will_____.**
    (a) Value the child's precious time and, therefore, teach as per your plan
    (b) Feel disturbed seeing the reluctance of the children to study
    (c) Allow students the freedom to come up with what they want and gradually connect them to your plan
    (d) None of these
25. **The teacher who has developed an interest in teaching _____.**
    (a) Studies problem of student behaviour
    (b) Compares different types of tests
    (c) Refuses to be guided by the rules of thumb
    (d) None of these

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26. **Today's parents exert a lot of pressure for achievement on their children as _____.**
(a) They want to fulfil their dreams through their children
(b) They are scared about their children's future
(c) The world is getting competitive everyday
(d) None of these

27. **An effective teacher_____.**
(a) Can manage his/her class well
(b) Knows his / her subject very well
(c) Cares for his/ her students (d) None of these

28. **One learns best in a classroom where_____.**
(a) Every child gets a chance to explore
(b) The teacher does not give punishment
(c) There is no fixed curriculum (d) None of these

29. **The school and community should work together as _____.**
(a) The school is an integral part of the community
(b) The community provides resources for learning
(c) The community helps in understanding the nature of students
(d) None of these

30. **Hyperactive children need _____.**
(a) Special attention in the classroom
(b) Separate classroom
(c) Special teachers (d) None of these

31. **A child's potential for creativity is reflected in his/ her_____.**
(a) Classroom discussion (b) achievement scores
(c) Out-of-the-box thinking (d) None of these

32. **Teaching is also a learning activity for teachers as _____.**
(a) It develops an in depth understanding of a discipline
(b) Teachers need to do action research
(c) Teachers is a process not a product
(d) None of these

33. **Absenteeism can be tackled by _____.**
(a) Guiding (b) Punishing the students
(c) Giving the sweets (d) None of these

34. **Discipline means_____.**
(a) Strict-behaviour (b) Severe punishment
(c) Going by the rules (d) None of these

35. **If any child does not come to school regularly you will_____.**
(a) Not bother (b) Struck off his name
(c) Meet the parents and encourage them.
(d) None of these

36. **In co-education you are supposed to _____.**
(a) Make separate rows of boys and girls
(b) Give preference to boys over girls
(c) Deal according to need (d) None of these

37. **One of the basic principles of socializing individuals is _____.**
(a) Religion (b) Caste

(c) Education (d) None of these

38. **_____ skills are the most essential for a teacher.**
(a) Teaching (b) Listening
(c) Oration (d) None of these

39. **Success in developing values is mainly dependent upon_____.**
(a) Government (b) Society
(c) Family (d) None of these

40. **Good reading aims at developing:**
(a) Understanding (b) Pronunciation
(c) Sensitivity (d) None of these

41. **The primary duty of a teacher is to be responsible to his/her____.**
(a) Family (b) Students
(c) Society (d) All of the above

42. **Which of the following is not related to educational achievement?**
(a) Heredity (b) Experiences
(c) Practice (d) None of these

43. **One of the students of a class hardly talks in the class. How would you encourage him to express himself?**
(a) By organising discussions
(b) By encouraging children to take part in classroom activities
(c) By organizing educational games/ programmes in which - children feel like speaking-
(d) None of these

44. **Main function of education should be____**
(a) To prepare a child for life (b) To develop capabilities of man
(c) To help children in adjustment (d) None of these

45. **Most important work of teacher is____**
(a) To maintain discipline in class (b) To take examination
(c) To make teaching interesting (d) None of these

46. **Your education will be successful if____**
(a) You get a job (b) You get self-satisfaction
(c) People pay respect to you (d) None of these

47. **Students should be allowed to play games because____**
(a) It develops cooperation and physical balance
(b) It makes them physically strong
(c) It helps in passing time (d) None of these

48. **If students of your class are naughty, then what will you do?**
(a) You will inform the principal (b) You will not teach in that class
(c) You will punish them (d) None of these

49. **You will develop social values among students by____**
(a) Telling them good stories (b) Behaving ideally
(c) Developing sense of discipline (d) None of these

50. **What will you do for organisation of extracurricular activities?**
(a) Do nothing special
(b) Help only in activities of your interest
(c) Help in all activities as ordered by Principal
(d) None of these

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51. **Teaching is a good profession because____**
(a) Teachers get opportunity of free service from students
(b) Teachers get good salary
(c) Teachers enjoy teaching (d) None of these

52. **What will you do in vacant period of school? You will____**
(a) Read magazines in library (b) Check home work of students
(c) Take tea in canteen (d) None of these

53. **A child learns first from his____**
(a) Family (b) Teachers of Primary School
(c) Mother (d) None of these

54. **A teacher should know child psychology because____**
(a) It helps in developing self confidence in him
(b) It makes him practical
(c) It helps in teaching effectively (d) None of these

55. **A good teacher is he who is____**
(a) Dutiful (b) Honest
(c) True (d) None of these

56. **The medium of education should be____**
(a) Regional language (b) Mother language
(c) National language (d) None of these

57. **You want to become teacher because____**
(a) Your parents want (b) It is easy
(c) You are interested in it (d) None of these

58. **Why does a teacher ask question in class?**
(a) To punish the students (b) To maintain discipline
(c) To attract student's attention (d) None of these

59. **'Learning by doing' is useful for children because____**
(a) They understand better by doing
(b) They like doing activities
(c) It keeps them busy (d) None of these

60. **Local community should participate in school education____**
(a) To direct teachers
(b) To develop teaching-learning material
(c) To mobilise additional resources
(d) None of these

61. **Montessori education system emphasizes____**
(a) Observation of natural event (b) Training of senses
(c) Reading, writing and arithmetics
(d) None of these

62. **Which computer language was developed to educate children?**
(a) Fortran (b) Cobol
(c) Basic (d) None of these

63. **If a student interrupts in your class, you will_____.**
(a) ask him to leave the class (b) ask him to behave properly
(c) assess his reasons to do the same
(d) None of these

64. **A student has not completed his homework. You will address him by saying _____.**
(a) When are you going to complete it?
(b) You did not do it. Try it
(c) Why did you not complete it?
(d) None of these

65. **Schools should be concerned with the development of child, which should include____**
(a) Acquisition of knowledge by the child
(b) Acquisition of life-skills by the child
(c) Acquisition of skills required by the nation
(d) None of these

66. **The main purpose of 'Parent-Teacher-Association (PTA)' in any school is to_____.**
(a) Keep students in check/control
(b) Collect additional funds for remedial teaching
(c) Involve parents for improvement of school functioning
(d) None of these

67. **If a student gives a partially correct response to your question. You will_____.**
(a) Seek further information (b) Provide reinforcement
(c) Reframe your question (d) None of these

68. **School can be called a social agent if_____.**
(a) It transmits knowledge
(b) It educates about rights and duties
(c) It organises various activities (d) None of these

69. **One basic difference between traditional schools and open learning schools is that_____.**
(a) The former are systematic
(b) The former carry personal touch
(c) The latter use modern gadgets (d) None of these

70. **School can be considered a _____ group as far as socialising agency is concerned.**
(a) Primary (b) Secondary
(c) Supplementary (d) None of these

71. **All of the following statements are true except_____.**
(a) Acquisition of 'life-skills' is part of maturation
(b) Acquisition of 'life-skills' is part of social process
(c) 'Life-skills' are directly moulded
(d) 'Life-skills' are learnt

72. **A student wants to share his problem with his teacher and visits the teacher for the same at his home. In such a situation, the teacher should_____.**
(a) Suggest to him to escape from his home
(b) Contact the student's parents and provide help
(c) Extend reasonable help and boost his morale
(d) None of these

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73. If a student alleges you of showing favouritism in evaluation of scripts, you will_____.
(a) Reject his allegations (b) Adopt punitive measure
(c) Show his answer book and few more
(d) None of these

74. The major responsibility with which school personnel have been entrusted is that of—
(a) Adjusting social demands to the needs of the child
(b) Adjusting the child to conform to the demands of society
(c) Changing human nature to conform to social expectations
(d) None of these

75. The best reason because of which a teacher can command respect from his students is if_____.
(a) He follows innovative practices in the class
(b) He dictates notes to the class
(c) He reads and explains the text-book
(d) None of these

76. Development of moral values among students is very important. To develop the same, you will_____.
(a) Encourage moral value related works
(b) Organise lectures
(c) Display stories based on moral values
(d) None of these

77. Teaching aids are useful because they_____.
(a) Help teacher's work (b) Activate all senses
(c) Make learning more meaningful
(d) None of these

78. Teacher's classroom behaviour should be good because _____.
(a) It will set an example (b) Students will be more attentive
(c) Environment would be conducive to learning
(d) None of these

79. You have a class which is very heterogeneous in height. You should allow a seating arrangement_____.
(a) That is random
(b) Where smaller students are allowed to sit in such a way that they can see and participate easily in class activities
(c) that is purely based on height (d) None of these

80. _____ may not be the best reason for cheating in the classroom examination.
(a) Too lazy to study
(b) Parental pressure for good marks
(c) Self-prestige (d) None of these

81. In this age of academic excellence demand, inclusion of games and sports in schools is_____.
(a) Necessary for the co-ordinated development of the individual
(b) Taking away a lot of time from academic work
(c) Giving time for leisure or relaxation

(d) None of these

82. While teaching the concept of a 'circle', you will _____.
(a) Present a picture of a circle
(b) Present pictures of circles of various sizes
(c) Present pictures of circles and ellipses
(d) None of these

83. Teaching would be more effective if the teacher_____.
(a) Makes his intent purposeful (b) Is master of the subject
(c) Uses various instructional aids (d) None of these

84. The schools should concentrate on _____.
(a) Development of traits to face hurdles of daily life
(b) Inculcation of values cherished by the community
(c) Development of traits of good citizenship
(d) None of these

85. Emotional Adjustment of students is effective in _____.
(a) Personality formation (b) Class-teaching
(c) Discipline (d) All of the above

86. _____ is closely related to teaching skills.
(a) Blackboard writing (b) Solving questions
(c) Asking questions (d) All the above

87. Character is developed by_____.
(a) Will-power (b) Conduct and behaviour
(c) Morality (d) All of the above

88. _____ is not a level of teaching learning.
(a) Differentiation level (b) Memory level
(c) Reflective level (d) Understanding level

89. The determinant of teaching skill training is_____.
(a) Components (b) Pupil-teacher relation
(c) Supervisor (d) Headmaster

90. For a good communication _____ is required.
(a) Speaking without pause (b) Dramatic Presentation
(c) Speaking in a mild tone (d) None of these

91. _____ is an important approach to educational planning.
(a) Man-power approach (b) Social Demand approach
(c) Both a & b (d) None of these

92. Institutional planning should be based on_____.
(a) Aim and needs (b) Time-table
(c) Administration (d) Need

93. A teacher must have a/an _____behaviour.
(a) Administrative (b) Instructive
(c) Idealistic (d) Directive

94. Computer language is based on_____.
(a) Number system (b) Symbol system
(c) Series system (d) None of these

95. The main task of educational computer is_____.
(a) Scoring the answers (b) Preserve the information
(c) Analysis of data (d) All of the above

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96. UNESCO satellite directed television program was used first
(a) 1926 (b) 1959
(c) 1961 (d) 1965

97. Which of the following instructional procedure is the main component?
(a) Synaptic teaching model (b) Basic teaching model
(c) Inductive model (d) Social-stimulation

98. It is popularly said that any two students are not alike. This implies that they differ in their
(a) Physical and mental set up (b) Aptitude
(c) Social status (d) Attitude

99. Out of the following, in which lesson, a general rule is explained first and then examples are illustrated?
(a) Deductive lesson (b) Inductive lesson
(c) Cognitive lesson (d) Skill lesson

100. Counselling is provided to assist an individual
(a) To diagnose learning deficiencies
(b) To understand and solve problem
(c) To develop insight (d) To develop the personality

ANSWERS

1.	a	2.	a	3.	d	4.	c	5.	a
6.	a	7.	b	8.	c	9.	a	10.	c
11.	b	12.	c	13.	c	14.	a	15.	c
16.	b	17.	b	18.	b	19.	d	20.	c
21.	b	22.	b	23.	c	24.	c	25.	a
26.	c	27.	c	28.	a	29.	a	30.	a
31.	c	32.	c	33.	a	34.	c	35.	c
36.	d	37.	c	38.	a	39.	c	40.	a
41.	b	42.	a	43.	c	44.	b	45.	c
46.	b	47.	a	48.	c	49.	b	50.	c
51.	c	52.	a	53.	c	54.	c	55.	a
56.	c	57.	c	58.	c	59.	a	60.	c
61.	b	62.	c	63.	c	64.	c	65.	b
66.	c	67.	b	68.	c	69.	b	70.	b
71.	a	72.	c	73.	c	74.	b	75.	a
76.	d	77.	c	78.	c	79.	b	80.	c
81.	a	82.	b	83.	c	84.	c	85.	d
86.	d	87.	d	88.	a	89.	a	90.	a
91.	c	92.	a	93.	c	94.	a	95.	d
96.	d	97.	b	98.	a	99.	a	100.	b

DIAGNOSE YOUR PHYSICS KNOWLEDGE

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KINEMATICS MOTION IN ONE DIMENSION

SET – I

1. **A ball is dropped off a high sea cliff _____.**
   (a) Its initial velocity is zero.
   (b) Its final velocity is negative.
   (c) Its acceleration is 10 m/s^2.
   (d) Its acceleration is –10 m/s.

2. **Acceleration is –9.8 m/s^2.**
   (a) Velocity is negative.
   (b) Acceleration is zero.
   (c) Acceleration is 9.8 m/s^2.
   (d) When ball is thrown straight up in the air

3. **An it produces object is moving in the air under the influence of gravity _____**
   (a) Positive acceleration.
   (b) Negative velocity.
   (c) Negative acceleration and positive velocity.
   (d) None of these.

4. **A ball is projected vertically up and is found to be at a height h at times 1s and 3s. Ignore air resistance and take g = 10 ms^{-2}. The maximum height of ball is _____.**
   (a) 20 m
   (b) 50 m
   (c) 100 m
   (d) 200 m

5. **A piece of wood is released from a helicopter ascending vertically up with uniform velocity of 2ms^{-1}. Ignore air resistance and take g = 10 ms^{-2}. The velocity of the piece after 0.2 s will be _____.**
   (a) Zero
   (b) 14 ms^{-1}
   (c) 20 ms^{-1}
   (d) 30 ms^{-1}

6. **An astronaut throws a stone of mass m vertically upwards with velocity 10 ms^{-1}. It reaches maximum height of 10 m. If another stone of mass 2m is thrown upwards with velocity 20 ms^{-1}, the maximum height reached will be _____**
   (a) 20 m
   (b) 40 m
   (c) 60 m
   (d) 80 m

7. **Two birds are flying straight towards each other at the similar speed. If the first bird is flying at a velocity v, what is the velocity of the second bird?**
   (a) v
   (b) $-v$
   (c) $2v$
   (d) None of these

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8. **On a planet with no air resistance, dropped a pair of handcuffs and a tissue from the same height at the same time, which one will reach the ground first?**
   (a) Tissue
   (b) The handcuffs
   (c) Both will hit the ground at the same time
   (d) None of these

9. **Usually, acceleration of objects due to the earth's gravitational pull is _____**
   (a) Smaller if the object is further away
   (b) Constant
   (c) Positive
   (d) Negative

10. **The branch of physics 'Kinematics' is concerned with**
   (a) Describing the speed of objects
   (b) Describing the movement of objects
   (c) Action at a distance
   (d) None of these

11. **A raindrop on a rainy day takes one minute from the time it leaves the cloud until it hits your umbrella, 3 miles below. The average velocity of the raindrop is**
   (a) 30 miles/hr
   (b) 60 miles/hr
   (c) 180 miles/hr
   (d) None of these

12. **A car travelling at constant velocity v applies brakes to save a cat which is 8 ft away. If the braking action causes a constant deceleration a, how long does it take for the car to come to absolute stop?**
   (a) $t = 60a$
   (b) $t = 80a$
   (c) $t = 180a$
   (d) $t = v/a$

13. **The velocity of a car described by the position function $x(t) = 3x^2 + \frac{2}{x^2}$ at time $t = -1$**
   (a) -2
   (b) 2
   (c) 12
   (d) -12

14. **The acceleration of an object described by the position function $x(t) = 3x^2 + \frac{2}{x^2}$ at time $t = -1$**
   (a) -8
   (b) 5
   (c) 18
   (d) None of these

15. **In creature-land, the measure of one's hardcoreness is directly linked to how high one can jump. Unluckily, creatures cannot jump straight up, but must take a running start. If creature A jumps with initial velocity vector (2, 2, 5), and creature B jumps with initial velocity vector (5, 4, 2), which creature is more hardcore?**
   (a) Creature A
   (b) Creature B
   (c) Both a & b
   (d) None of these

16. **In question 25, which creature travels maximum during its jump?**
   (a) Creature A
   (b) Creature B
   (c) Both a & b
   (d) None of these

17. **Two persons A and B are hanging out on the moon when they decide to have a contest to see who can shoot a bullet farther. Both use the same guns. A decides to shoot at a 60°, while B holds his gun at 45°. Whose bullet lands the furthest away?**
   (a) A
   (b) B
   (c) Both A and B
   (d) None of these

18. **A hotel is located approximately 10 ft below the earth's surface. The acceleration due to gravity experienced by members working in this hotel is _____**
   (a) Greater than the earth's surface
   (b) Lesser than the earth's surface
   (c) Approximately equal to that of people on the earth's surface
   (d) None of these

19. **Two students A and B decide to go on bicycles. 'A' rides at a speed of 10 m/h while 'B' average speed is 20 m/h. After several hours, both come home and park their bicycles exactly where they started. A's average velocity for the entire ride is _____.**
   (a) Lower than B's average velocity
   (b) Higher than B's average velocity
   (c) Zero
   (d) None of these

20. **Salman enjoys throwing wrinkled pieces of paper into a wastebasket across the room. Over the years, he has carefully kept track of all the different combinations of initial speeds and angles at which he can throw the wrinkled pieces of paper while still making the same basket. He hopes to have someday a whole list of all the possibilities. Salman's efforts are useless because _____.**
   (a) He will never have enough time to exhaust all possibilities
   (b) There is really only one way to make the basket, and Salman is confused about this because a janitor keeps moving the wastebasket at night
   (c) There are infinitely many ways to make this basket from the same position
   (d) None of these

21. **If an object has an acceleration of 0 m/s^2, then**
   (a) Its position is not changing.
   (b) Its acceleration is not changing.
   (c) Its velocity is not changing.
   (b) None of these.

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22. A runner runs one time around the track 400m in 38s. What is his average velocity?
(a) 100m/s (b) 50m/s
(c) 0 m/s (d) None of these

23. If a bus is moving eastward and slowing down, then the direction of its acceleration is _____.
(a) Eastward (b) Westward
(c) Northword (d) None of these

24. Which one of the following statements is NOT true of a free-falling object?
(a) Falls with a constant speed of -10 m/s.
(b) Falls with velocity of -10 m/s.
(c) Falls with acceleration of $10m/s^2$.
(d) None of these.

25. The average speed of an object which moves 10 km in 30 minutes is _____.
(a) 10 km/hr (b) 20 km/hr
(c) 25 km/hr (d) 50 km/hr

26. A speedometer is placed on a free-falling object in order to measure its instantaneous speed. If we neglect the air resistance then its speed increases each second by ____.
(a) 5 m/s (b) 10 m/s
(c) 15 m/s (d) 20m/s

27. During the throw of a cricket ball, the speed of the ball increases from 0 m/s to 30 m/s over a time of 0.100 s. The average acceleration of the ball is ____.
(a) $100m/s^2$ (b) $200m/s^2$
(c) $300 m/s^2$ (d) $400m/s^2$

28. An astronaut drops a hammer from moon's surface. If the hammer falls 6 m upright in 2.7s, what is the hammer acceleration due to the gravity of the moon?
(a) $1.6 m/s^2$ (b) $2.2 m/s^2$
(c) $4.4 m/s^2$ (d) $9.8 m/s^2$

29. What is the resulting speed when two vectors, 3.0 m/s north and 4.0 m/s east are combined?
(a) 2.0 m/s (b) 4.0 m/s
(c) 6.0 m/s (d) 5.0 m/s

30. A man covers distance of 5m in north, then 4m east and finally 2m south. Calculate the resultant displacement of the man after the entire walk?
(a) 2m (b) 5m
(c) 8m (d) 15m

31. Two cars are travelling in same direction. Velocity of first car is 85 km/h and of the second is 75 km/h. What is the second car's velocity relative to the first car's velocity?
(a) +100 km/hr (b) -100 km/hr
(c) +175 km/hr (d) None of these

32. How much time a rocket travelling at speed of 220 km/h takes to go a distance of 770 km?
(a) 3.5 hr (b) 2.5 hr
(c) 4.29 hr (d) 5.0 hr

33. A car increases its speed from 9.6 m/s to 11.2m/s in 4 seconds. The average acceleration of the car in a 4 seconds interval is _____.
(a) $0.40 m/s^2$ (b) $3.8 m/s^2$
(c) $6.4 m/s^2$ (d) $8.2 m/s^2$

34. An object whose velocity is negative and acceleration is positive represents an object that is _____.
(a) Accelerating
(b) Decelerating
(c) Neither accelerating nor decelerating
(d) None of these

35. A ball, initially at rest at t = 0 seconds, rolls down a long incline. On the incline, its acceleration will be less than $9.8 m/s^2$, although the acceleration will still be constant. If the ball has rolled 1m at t = 2 seconds, how far will it have rolled at t =4 seconds?
(a) 2 m (b) 3 m
(c) 4 m (d) None of these

36. A scientist is studying the constant acceleration of three heavy bikes and gets the following results:
Bike I changes its speed from v to $2v$ in a time interval of t
Bike II changes its speed from v to $3v$ in a time interval of $2t$.
Bike III changes its speed from v to $5v$ in a time interval of $5t$.
The correct relationship between the accelerations of three bikes is
(a) The acceleration of bike I = the acceleration of bike II = the acceleration of bike III
(b) The acceleration of bike I > the acceleration of bike II > the acceleration of bike III
(c) The acceleration of bike I = the acceleration of bike II > the acceleration of bike III
(d) The acceleration of bike I < the acceleration of bike II < the acceleration of bike III

37. In word analogy, acceleration : velocity
(a) Velocity : displacement
(b) Distance : displacement
(c) Displacement : acceleration
(d) None of these

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38. Two balls have been dropped at a little different time from a high roof. The difference between their speeds is 4.0 m/s at that time. What is the difference between their speeds two seconds later?
(a) 4 m/s (b) 6 m/s
(c) 8 m/s (d) 10 m/s

39. A mallet and a feather are dropped at the same time, near the surface of the Earth will not keep up as they drop. However, if this test was to be performed on the Moon, the mallet and the feather would keep up with each other. This shows that
(a) There is air on the Moon
(b) There is no air on the Moon
(c) The Moon has no gravitational force
(d) The gravity on the Moon is much stronger than it is on the Earth

40. The speed of an object, one second after it has been dropped on the planet, is 8 m/s. What will its speed after 3 seconds when it was first dropped?
(a) 24 m/s (b) 32 m/s
(c) 38 m/s (d) 42 m/s

41. An object is thrown up from the ground at sea level on Earth with an initial speed of 30 m/s. Which of the following is correct when the object will be in the air before it strikes the ground again?
(a) 6 s (b) 9 s
(c) 12 s (d) 30 s

42. Three students are leaning over the edge of a mountain. Each throws a ball in a different way. Ball A is dropped from rest, ball B is thrown downward with an initial speed of 10 m/s and ball C is thrown upward with an initial speed of 10 m/s. Since the students were leaning over the edge of a mountain, all these balls eventually strike the ground at the base of the cliff. Which choice is best?
(a) Speed of ball A < speed of ball B = speed of ball C
(b) Speed of ball A = speed of ball B
(c) Speed of ball B > speed of ball A
(d) Speed of ball A < speed of ball C

43. A jeep covers 90 m distance in 15 seconds *(in north)*. Then it turns around and covers 40 m distance in 5 seconds *(in south)*. During 20 seconds, what is the magnitude of the average velocity of jeep?
(a) 2.5 m/s (b) 9 .5 m/s
(c) 15.5 m/s (d) 20.5 m/s

ANSWERS

1.	a	2.	d	3.	c	4.	a	5.	a
6.	b	7.	b	8.	c	9.	a	10.	b
11.	c	12.	d	13.	a	14.	c	15.	a

16.	d	17.	b	18.	c	19.	c	20.	c
21.	c	22.	c	23.	b	24.	a	25.	b
26.	b	27.	c	28.	a	29.	d	30.	b
31.	d	32.	a	33.	a	34.	b	35.	c
36.	c	37.	a	38.	a	39.	b	40.	a
41.	a	42.	a	43.	a				

SET – II

1. The speedometer of a car interprets_____.
(a) Average velocity (b) Instantaneous speed
(c) Average acceleration (d) None of these

2. A poignant body is covering distance in proportion to the square of time. _____ of the body is constant.
(a) The speed (b) The direction
(c) The velocity (d) The acceleration

3. An element shifts along the axis in such a technique that its co-ordinate x diverges with time t according to the expression $x = 2 - 5t + 6t^2$ metre. The initial _____ of the particle is–5 m/s.
(a) Velocity (b) Direction
(c) Speed (d) None of these

4. The relation flanked by time t and distance x is $t = \alpha x^2 + \beta x$; where a and b are constants. The retardation is _____
(a) $2\alpha v^3$ (b) $4\alpha v^3$
(c) $6\alpha v^3$ (d) $8\alpha v^3$

5. If a spot moves with unvarying acceleration and v_1, v_2 and v_3 indicates the average velocities in the three consecutive intervals of time t_1, t_2 and t_3 then _____ relation is correct.
(a) $(v_1 + v_2) : (v_2 - v_3) = (t_1 + t_2) : (t_2 + t_3)$
(b) $(v_1 - v_2) : (v_2 - v_3) = (t_1 + t_2) : (t_2 + t_3)$
(c) $(v_1 + v_2) : (v_2 + v_3) = (t_1 - t_2) : (t_2 + t_3)$
(d) None of these

6. A body is stimulated along a straight line by equipment delivering steady power. The distance moved by the body in time t is proportional to _____.
(a) $t^{10/4}$ (b) $t^{13/4}$
(c) $t^{3/2}$ (d) None of these

7. A particle is moving towards east with a velocity of 5 m/s. In 10 seconds the velocity reduces to 5 m/sec north-wards. The average acceleration in this time is_____ towards north-east.
(a) 1/4 m/s^2 (b) $1/\sqrt{2}$ m/s^2
(c) 1/16 m/sec^2 (d) 1/24 m/sec^2

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8. A particle is thrown perpendicularly upward with a velocity of 490 cm/s. It will return to this location after _____.
(a) One second (b) Two seconds
(c) Three seconds (d) None of these

9. An object is dropped with a velocity of 100 m/s. It will hit the ground in about_____.
(a) 15 sec (b) 20 sec
(c) 25 sec (d) 30 sec

10. A train begins from rest and at first travels with uniform acceleration while travelling from one place to another. After covering some distance the train goes with uniform velocity. Before reaching the second place m, the train moves with uniform retardation. Time taken by the train during different stages is in the ratio 1:6:1 and during journey the train achieves the utmost velocity 32 km/ h. Average velocity of the train throughout the whole journey is _____.
(a) 14 km/h (b) 19 km/h
(c) 28 km/h (d) 25 km/h

11. At first a car is affecting with uniform speed on a directly road. Car practices a uniform acceleration 1 m /s^2 for 12 s. Due to this reason, the car passes through 190 m in the 12th second. The initial _____ of the car is 178. 5 m/s.
(a) Speed (b) Direction
(c) Velocity (d) None of these

12. Two balls are left smoothly from the heights h_1 and h_2 at the same time. The ratio of time taken to reach the _____ by the two balls is $\sqrt{\frac{h_1}{h_2}}$.
(a) To reach the space (b) To reach the ground
(c) To reach the water (d) None of these

13. A stone is left smoothly when a balloon is affecting up with velocity of 0.7 m/s at an elevation of 756 decimetre. The stone will reach the ground within _____.
(a) 8 seconds (b) 6 seconds
(c) 4 seconds (d) 2 seconds

14. A car starting from rest covers an area of 10 metre in 10 seconds. The uniform _____ of the car will be 1.05 m/s^2.
(a) Retardation (b) Speed
(c) Acceleration (d) None of these

15. A stone is dropped into a stream and the sound of the splash is heard after 11.5s. If the velocity of the sound be 327 m/s then _____ shall is 490 m.
(a) The depth of the stone (b) The depth of the pebble
(c) The depth of the stream (d) None of these

ANSWERS

1	b	2	d	3	a	4	a	5	b
6	c	7	b	8	a	9	b	10	c
11	c	12	b	13	c	14	c	15	c

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KINEMATICS MOTION IN TWO DIMENSIONS

PROJECTILE MOTION

1. A marble L is dropped perpendicularly. Another identical marble M falls horizontally from the identical point simultaneously.
(a) L will reach the ground earlier than M
(b) M will reach the ground earlier than L
(c) Both will reach the ground at the similar time
(d) None of these

2. An aeroplane flying with speed v explains circular path of radius R in a perpendicular plane. A food carton is dropped from the aeroplane when it is at the highest point. There is space between the aeroplane and ground space. The _____ in space will be parabolic.
(a) Trajectory of the food carton
(b) Trajectory of the aeroplane
(c) Oblique
(d) None of these

3. If you would like to boot a football to the maximum distance the angle at which it should be booted is _____.
(a) 45° (b) 30°
(c) 60° (d) 90°

4. Ahmed throws Javelin. In his first attempt, he keeps the angle of projection surpassed to 45° by an amount θ°. In his second attempt he keeps the angle of projection less than 45°. Both throws have equivalent ranges. By what amount angle of projection fall short 45° in the second attempt?
(a) (30 + θ)° (b) θ°
(c) (45 + 2θ)° (d) None of these

5. _____ be the angle of projection for the maximum height attained by the projectile would be equal to the range of projectile.
(a) 45° (b) 90°
(c) 180° (d) $\cos^{-1}\frac{1}{\sqrt{17}}$

6. From the top of a building, a ball is thrown horizontally with velocity v(0). If the height of the tower is h then the magnitude of the displacement of the ball is _____.+
(a) 90° (b) 180°

(c) $h+\frac{v(0)^2}{2g}$ (d) $\sqrt{\frac{gh^2+2v(0)^2h}{g}}$

7. An element stirring in a plane has the coordinates at an instant; $t-\left(\frac{3}{2}t^2, 2t^2\right)$. At this instant, the angle flanked by the velocity and the acceleration is 60°. The magnitude of initial velocity of element is
(a) 10t (b) $5t\sqrt{3}$
(c) 20t (d) None of these

8. Judge the movement of the tilt of the minute arm of a lock. In _____ the displacement and change in velocity both are maximum.
(a) Ten minutes (b) Twenty minutes
(c) Thirty minutes (d) None of these

9. Farah sitting in a train, moving with uniform velocity $\vec{v}$, tosses a coin. The parabolic path will be observed by a spectator
(a) Standing on the ground
(b) Sitting in another train moving on similar track with uniform velocity in opposite direction
(c) Sitting in another train moving on equivalent track with some higher uniform velocity in the identical direction
(d) All of the above

10. A bullet is fired straight aiming to a lion and the projection velocity of the bullet is v(0). Suppose that the projection angle is θ. If the distance between the lion and projection point is z m then after firing, lion does not move. The least distance between _____ at rest is $\frac{1}{2}\frac{gz^2}{v(0)^2}$.
(a) The moving bullet and gun (b) Only the moving bullet
(c) Only the moving gun (d) The moving bullet and lion

11. Hamid throws the tennis ball up with velocity 5 m/sec at an angle 60° with X axis. Before reaching the highest point the ball hits the wall and its velocity is reduced by 5%. At the time of smash, its velocity vector creates an angle of 30° with X axis and after collision its velocity vector is upturned. To catch the returning ball at the same height; boy has to move _____.
(a) 0.115 m forward (b) 1.175 m forward
(c) 0.125 m forward (d) 2.129 m forward

12. A pellet fired from the land chases parabolic course. Select the accurate statements.
(a) Velocity is maximum at the point of projection
(b) Speed of the projectile is slightest at the top

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(c) Horizontal velocity part, at any instant during the projectile motion, remains equivalent to the initial horizontal velocity part

(d) All of the above

13. A ball is thrown from the peak of a roof horizontally with initial velocity $v(0)$. Its velocity after t seconds is $\vec{v}(t)$ and acceleration due to gravity is $\vec{g}$. Select the accurate statement(s).

(a) $\vec{v}(t) = \vec{v}(0) + \vec{g}t$

(b) The horizontal velocity of the ball after t seconds is $\vec{v}(0)\,t^2$.

(c) The vertical displacement of the ball after t seconds is $\frac{1}{2}\vec{g}\,t^2$

(d) Both a & c

ANSWERS

1.	c	2.	d	3.	a	4.	b	5.	d
6.	d	7.	b	8.	c	9.	d	10.	d
11.	c	12.	d	13.	d				

VECTORS AND EQUILIBRIUM

1. The physical quantities which require magnitude as well as direction for their complete description are called
(a) Scalars (b) Vectors
(c) Both scalar and vector (d) None of these

2. Which of the following is not a vector?
(a) Velocity (b) Momentum
(c) Torque (d) Work

3. Which of the following is a vector?
(a) Power (b) Force
(c) Speed (d) Mass

4. A letter with arrow head above or below it is used to represent
(a) Vector (b) Scalar
(c) Both a and b (d) None of these

5. Two lines drawn at right angle to each other are called coordinate axes and the system is called
(a) Cartesian system (b) Rectangular coordinate system
(c) Cylindrical coordinate system (d) Both a and b

6. The vectors in space are
(a) Two dimensional (b) Three dimensional
(c) Four dimensional (d) Un-dimensional

7. Y-axis is also called
(a) Abscissa (b) Origin
(c) Ordinate (d) None of these

8. The angle between the three axes of rectangular coordinate system is
(a) $0°$ (b) $45°$
(c) $90°$ (d) $120°$

9. Vectors can be added by
(a) Head to tail rule (b) Rectangular components
(c) Both a and b (d) None of these

10. Addition of vectors is
(a) Commutative and associative
(b) Commutative but not associative
(c) Associative but not commutative
(d) Neither commutative nor associative

11. Which of the following is false?
(a) $\vec{a}+\vec{b}=\vec{b}+\vec{a}$ (b) $\vec{a}-\vec{b}=-\vec{b}+\vec{a}$

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(c) $\vec{a}+\left(\vec{b}+\vec{c}\right)=\left(\vec{a}+\vec{b}\right)+\vec{c}$ (d) None of these

12. A certain vector is multiplied by an integer 'n' and the product is a vector whose direction is opposite to the original vector. What do you deduce about 'n'?
(a) $n=0$ (b) $n<0$
(c) $n>0$ (d) $0<n<1$

13. A vector whose magnitude is zero and have any arbitrary direction is called
(a) Null vector (b) Unit vector
(c) Equal vector (d) Negative vector

14. Two vectors which are parallel to each other means they
(a) Must be equal (b) May be equal
(c) May be unequal (d) Both b and c

15. Which of the following is a unit vector?
(a) $\hat{i}$ (b) $\hat{j}$
(c) $\hat{k}$ (d) All of these

16. It is convenient to resolve a vector into the components which are
(a) Parallel to each other (b) Anti-parallel to each other
(c) Perpendicular to each other (d) None of these

17. The angle between two rectangular components of a vector is
(a) $\frac{\pi}{2}$ (b) π
(c) $\frac{3\pi}{2}$ (d) 2π

18. Which of the following statement is correct?
(a) $A_x = A\sin\theta$ (b) $A_y = A\cos\theta$
(c) Both a and b (d) None of these

19. Which of the following statement is false?
(a) $A_x = A\cos 0\hat{i}$ (b) $A_y = A\sin\theta\hat{j}$
(c) $A^2 = A_x^2 + A_y^2$ (d) $A^2 = A_x^2\hat{i} + A_y^2\hat{j}$

20. The position vector of the line joining the points (2,3,4) and (5,6,7) is
(a) $7\hat{i}+9\hat{j}+11\hat{k}$ (b) $3\hat{i}+3\hat{j}+3\hat{k}$
(c) $10\hat{i}+18\hat{j}+28\hat{k}$ (d) $\hat{i}+\hat{j}+\hat{k}$

21. The vector having the magnitude 2 is represented by a unit vector $2\hat{i}+\hat{k}$. The original vector is
(a) $4\hat{i}+\hat{k}$ (b) $2\hat{i}+2\hat{k}$

(c) $2\left(\hat{i}+\hat{k}\right)$ (d) $4\hat{i}+2\hat{k}$

22. A line segment represented by $2\hat{i}+\hat{k}$ lies in
(a) xy plane (b) yz plane
(c) xz plane (d) in space

23. The product of mass and velocity is a
(a) Vector (b) Scalar
(c) May be vector or scalar (d) None of these

24. A vector having magnitude 0.5 makes an angle of 90° with x-axis. Its y-component is equal to
(a) 0 (b) 1
(c) 0.25 (d) 0.5

25. A line has rectangular components equal to 5 in magnitudes. The line makes an angle of _____ with the horizontal.
(a) 0° (b) 45°
(c) 90° (d) 180°

26. A certain vector $\vec{R}$ having positive x-component but negative y-component. This implies that the vector lies in the
(a) 1st quadrant (b) 2nd quadrant
(c) 3rd quadrant (d) 4th quadrant

27. tanθ is negative if the angle θ lies in
(a) 1st quadrant (b) 3rd quadrant
(c) Either 1st or 3rd quadrant (d) None of these

28. A force of 20N is acting on a body at an angle of 60°. The vertical component of the force is balanced by certain other force. The net force acting on the body is in x-direction and is equal to
(a) 1200N (b) 20N
(c) 10N (d) $10\sqrt{3}$N

29. The product of two or more vectors can be classified into _____ groups.
(a) 2 groups (b) 3 groups
(c) 4 groups (d) 5 groups

30. Scalar product of two vectors is also called
(a) Dot product (b) Vector product
(c) Cross product (d) Simple product

31. The dot product of vectors results in a
(a) Unit vector (b) Null vector
(c) Vector (d) Scalar

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32. If $\vec{A}$ and $\vec{B}$ be two vectors and 0 be the angle between them, then their scalar product is defined as

(a) $\vec{A}\cdot\vec{B} = AB\cos 0$

(b) $\vec{A}\cdot\vec{B} = A\left(\text{Projection of } \vec{B} \text{ on } \vec{A}\right)$

(c) $\vec{A}\cdot\vec{B} = B\left(\text{Projection of } \vec{A} \text{ on } \vec{B}\right)$

(d) All of these

33. Work is _____ product of force and displacement.
(a) Vector (b) Dot
(c) Cross (d) All of these

34. The dot product of two vectors is zero. This means the angle between the two vectors is
(a) 0° (b) 90°
(c) 180° (d) 360°

35. If $\vec{A}$ and $\vec{B}$ are two parallel vectors then
(a) $\vec{A}\cdot\vec{B} = 2AB$ (b) $\vec{A}\cdot\vec{B} = (AB)^2$
(c) $\vec{A}\cdot\vec{B} = AB$ (d) $\vec{A}\cdot\vec{B} = \vec{B}\cdot\vec{A}$

36. The dot product of vectors is
(a) Commutative only
(b) Associative only
(c) Both commutative and associative
(d) Either commutative or associative

37. Which of the following statement is true?
(a) $\hat{i}.\hat{j} = \hat{k}$ (b) $\hat{k}.\hat{j} = 0$
(c) $\hat{i}.\hat{i} = 0$ (d) $\hat{j}\cdot\hat{j} = -\hat{k}$

38. Which of the following statement is false?
(a) $\hat{i}.\hat{i} = 1$ (b) $\vec{A}\cdot\vec{A} = A^2$
(c) $\hat{i}\cdot\hat{i} = \hat{j}\cdot\hat{j} = \hat{k}\cdot\hat{k} = \vec{A}\cdot\vec{A}$ (d) $\hat{i}\cdot\hat{j} = \hat{j}\cdot\hat{k} = \hat{k}\cdot\hat{j} = \vec{A}\times\vec{A}$

39. Which of the following statement is false?
(a) $\vec{A}\cdot\vec{B} = \begin{pmatrix} \hat{i} & \hat{j} & \hat{k} \\ A_x & A_y & A_z \\ B_x & B_y & B_z \end{pmatrix}$ (b) $\vec{A}\cdot\vec{B} = \vec{B}\cdot\vec{A}$
(c) $\cos\theta = \dfrac{A_xB_x + A_yB_y + A_zB_z}{AB}$ (d) None of these

40. A force $\vec{F} = 2\hat{i} + \hat{j}$ units has its point of application moved from the point A(1,3) to B(5,6). The work done is
(a) $8\hat{i} + 3\hat{j}$ (b) 0
(c) 11 (d) 4

41. Which of the following is not a resultant of dot product?
(a) Power (b) Work
(c) Torque (d) None of these

42. The two vectors having magnitudes 3 and 5 respectively having cross product equal to zero. Their scalar product is
(a) 0 (b) 2
(c) 8 (d) 15

43. The cross product of two vectors is zero as well as their dot product. This implies that
(a) Vectors are equal
(b) Vectors are unequal
(c) Vectors are perpendicular
(d) One of the vectors is a null vector

44. Which of the following statement is true?
(a) $\vec{A}\times\vec{B} = AB\sin\theta$ (b) $\left|\vec{A}\times\vec{B}\right| = AB\sin\theta$
(c) $\vec{A}\times\vec{B} = \vec{A}\cdot\vec{B}$ (d) $\vec{A}\times\vec{B} = -\vec{B}\times\vec{A}$

45. Which of the following statement is false?
(a) Cross product results in a vector quantity.
(b) Cross product is commutative.
(c) Both of the above
(d) None of these

46. Let $\vec{A}$ and $\vec{B}$ be the two vectors. The product of $\vec{A}$ and $\vec{B}$ is a vector which is _____ to the plane containing $\vec{A}$ and $\vec{B}$.
(a) Parallel (b) Opposite
(c) Perpendicular (d) None of these

47. The direction of the resultant of cross product of vectors is determined by
(a) Right hand rule (b) Left hand rule
(c) Thumb rule (d) All of these

48. The cross product of two vectors is maximum in magnitude when the two vectors are
(a) Parallel to each other (b) Equal to each other
(c) Anti-parallel to each other (d) Perpendicular to each other

49. Which of the following statement is true?
(a) $\hat{i}\times\hat{j} = 0$ (b) $\hat{i}\times\hat{j} = \hat{k}$
(c) $\hat{i}\times\hat{j} = -\hat{k}$ (d) $\hat{j}\times\hat{i} = \hat{k}$

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50. Cross product of two parallel vectors results in a ___vector.
(a) Negative (b) Positive
(c) Null (d) None of these

51. Which of the following statement is true?
(a) $\vec{A}\times\vec{B}=(A_yB_z-A_zB_y)\hat{i}-(A_zB_x-A_xB_z)\hat{j}+(A_xB_y-A_yB_x)\hat{k}$
(b) $|\vec{A}\times\vec{B}|=AB\sin\theta$
(c) $\vec{A}\times\vec{B}=\begin{pmatrix}\hat{i} & \hat{j} & \hat{k}\\ A_x & A_y & A_z\\ B_x & B_y & B_z\end{pmatrix}$
(d) All of these

52. The magnitude of $\vec{A}\times\vec{B}$ is equal to the area of the _____ formed with $\vec{A}$ and $\vec{B}$ as two adjacent sides.
(a) Rectangle (b) Parallelogram
(c) Triangle (d) Quadrilateral

53. Torque is defined as_
(a) $\vec{\tau}=\vec{r}\times\vec{F}$ (b) $\vec{\tau}=\vec{F}\times\vec{r}$
(c) $\vec{\tau}=rF$ (d) $\vec{\tau}=\vec{F}.\vec{r}$

54. The force on a particle of charge q and velocity V in a magnetic field of strength B is defined as
(a) $\vec{F}=q\left(\vec{V}\times\vec{B}\right)$ (b) $\vec{q}\times\vec{V}B$
(c) $\vec{F}=\vec{q}\times\vec{B}V$ (d) None of these

55. The cross product of two vectors is zero when the angle between the two vectors is
(a) 0 (b) $\pi/4$
(c) $\pi/2$ (d) $3\pi/2$

56. The cross and dot products of two vectors is equal when the angle between two vectors is
(a) 0 (b) $\pi/6$
(c) $\pi/4$ (d) $\pi/2$

57. Work is defined as
(a) $W=\vec{F}\times\vec{d}$ (b) $W=\vec{F}.\vec{d}$
(c) $W=\vec{d}\times\vec{F}$ (d) $W=Fd\sin\theta$

58. The cross product of two unit vectors has a magnitude 0.5. What is the angle between the two vectors?
(a) 0 (b) $\pi/6$
(c) $\pi/2$ (d) None of these

59. The dot product of two unit vectors is 0.5. What is the angle between the two vectors?
(a) 0 (b) $\pi/6$
(c) $\pi/2$ (d) $\pi/3$

60. The cross product of two vectors has a magnitude 1 while their dot product has the same magnitude. What is the angle between the two vectors?
(a) 0 (b) $\pi/3$
(c) $\pi/6$ (d) $\pi/4$

61. The magnitude of torque is given as
(a) $\tau=rF$ (b) $\tau=\vec{r}\times\vec{F}$
(c) $\tau=rF\sin\theta$ (d) All of these

62. The moment arm is defined as the _____ distance from the line of action of the force to the pivot around which body rotates.
(a) Shortest (b) Perpendicular
(c) Both of them (d) None of these

63. It is easier to turn a bolt with a spanner when the spanner has a _____ handle.
(a) Short (b) Long
(c) Thin (d) Thick

64. When the line of action of force passes through the pivot point, the torque is
(a) Maximum (b) Minimum
(c) 1 (d) 0

65. The torque about the pivot of a rigid body is zero due to which component of force?
(a) X-component (b) Y-component
(c) Rectangular component (d) None of these

66. Torque is defined as: $\tau=(rF\sin\theta)\hat{n}$, where $\hat{n}$ is a unit vector in the direction
(a) Perpendicular to $\vec{F}$
(b) Perpendicular to $\vec{r}$
(c) Perpendicular to plane containing $\vec{r}$ and $\vec{F}$
(d) All of these

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67. SI unit of torque is
(a) J/s (b) Jm
(c) Nm/s (d) None of these

68. Unit of torque is
(a) Nm (b) J
(c) Dyne-cm (d) All of these

69. SI unit of work is
(a) N/m (b) Nm
(c) Dyne-cm (d) ft.lbf

70. The dimension of work is
(a) $[MLT]$ (b) $[ML^2T^2]$
(c) $[ML^3T^2]$ (d) $[ML^2T^{-2}]$

71. The torque acting on a body determines
(a) Linear acceleration (b) Momentum
(c) Angular acceleration (d) All of these

72. The torque acting on a body will be zero if the body is moving with
(a) Constant angular velocity
(b) Constant linear velocity
(c) Constant angular acceleration
(d) All of these

73. Pick the correct statement
(a) Torque is maximum when the body is at rest.
(b) Torque is the counter part of force for rotational motion.
(c) Torque is a scalar quantity.
(d) Torque is independent to the moment arm.

74. If the body is rotating in clockwise direction, the torque is
(a) Positive (b) Negative
(c) Maximum (d) Zero

75. Choose the false statement
(a) Torque is vector whereas work is a scalar quantity
(b) Torque and work has the same units
(c) Torque and work has the same dimensions
(d) None of these

76. A force F is acting on a rigid body. The body is said to be
(a) At rest
(b) Moving with uniform linear acceleration
(c) Moving with uniform angular acceleration
(d) All of these

77. How many conditions of equilibrium are there?
(a) 1 (b) 2
(c) 3 (d) 4

78. The 1st condition of equilibrium is
(a) $\Sigma\vec{F}=0$ (b) $\Sigma\vec{\tau}=0$
(c) $\vec{r}\times\vec{F}=0$ (d) All of these

79. The 1st condition of equilibrium in terms of rectangular components of coplanar force is
(a) $\Sigma\vec{F}_x=-\Sigma\vec{F}_y$ (b) $\Sigma\vec{F}_x=0, \Sigma\vec{F}_y=0$
(c) $\Sigma\vec{F}_x<\Sigma\vec{F}_y$ (d) $\Sigma\vec{F}_x>\Sigma\vec{F}_y$

80. If the 1st condition of equilibrium is satisfied, which of the following statement is true?
(a) The body is surely in equilibrium.
(b) The body may not be in equilibrium.
(c) The body is surely not in equilibrium.
(d) None of these

81. Two forces of equal magnitudes are acting at angles of 45° and 225° on a body to the horizontal respectively. According to 1st condition of equilibrium, the body is said to be
(a) In equilibrium (b) Not in equilibrium
(c) Rotating (d) At rest

82. When the 1st condition of equilibrium is satisfied, the body is said to be in
(a) Translational equilibrium (b) Rotational equilibrium
(c) Static equilibrium (d) Dynamic equilibrium

83. For a body to satisfy 1st condition of equilibrium, which of the following condition must be satisfied?
(a) Its angular acceleration is zero.
(b) Its angular velocity is zero.
(c) Its linear velocity is uniform.
(d) None of these

84. For the body to be in complete equilibrium, which statement is true?
(a) $\Sigma\vec{F}=0$ (b) $\Sigma\vec{\tau}=0$
(c) $\Sigma\vec{F}=0$ and $\Sigma\vec{\tau}=0$ (d) None of these

85. If the body is moving with uniform velocity and in equilibrium then its equilibrium is
(a) Partial (b) Dynamic
(c) Static (d) All of these

86. The second condition of equilibrium is defined as
(a) $\Sigma\vec{F}=0$ (b) $\Sigma\vec{\tau}=0$

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(c) $\Sigma\left(\vec{F}+\vec{\tau}\right)=0$ (d) None of these

87. When 2nd condition of equilibrium is satisfied, the body is said to be in
(a) Dynamic equilibrium (b) Static equilibrium
(c) Translational equilibrium (d) Rotational equilibrium

88. When 2nd condition of equilibrium is satisfied, the body is said to have
(a) Uniform linear acceleration
(b) Zero linear acceleration
(c) Uniform angular acceleration
(d) Zero angular acceleration

89. For the body to be in complete equilibrium, which of the following condition must be satisfied?
(a) 1st condition (b) 2nd condition
(c) Both 1st and 2nd conditions (d) None of the two conditions

90. The angular acceleration of a body is zero if
(a) $\Sigma\vec{F}=0$ (b) $\Sigma\vec{\tau}=0$
(c) $\Sigma\vec{F}+\Sigma\vec{\tau}=0$ (d) $\Sigma\vec{F}-\Sigma\vec{\tau}=0$

91. A vector lies in xy plane and both of its components are negative. This implies that the vector is in
(a) 1st quadrant (b) 2nd quadrant
(c) 3rd quadrant (d) 4th quadrant

92. tanθ, sinθ and cosθ; all have positive values when θ lies in
(a) 1st quadrant (b) 2nd quadrant
(c) 3rd quadrant (d) 4th quadrant

93. A vector has two components x and y. The x-component has a magnitude of 4 and y-component has a magnitude of 3. The magnitude of the vector is
(a) 7 (b) 5
(c) 1 (d) 25

94. A vector has a magnitude of 5 and it makes an angle of 30° with the horizontal. Its x-component is
(a) $\frac{5\sqrt{3}}{2}$ (b) 2.5
(c) $\frac{5}{\sqrt{2}}$ (d) 5

95. A vector has a magnitude of 10 and it makes an angle of 60°. The magnitude of its y-component is
(a) 2 (b) $5\sqrt{3}$

(c) $\frac{10}{\sqrt{2}}$ (d) 10

96. A vector has two rectangular components x and y and both are negative. The vector has a _____ magnitude.
(a) Negative (b) Positive
(c) Zero (d) 1

97. If $\vec{A}\times\vec{B}=0$ then which statement is correct?
(a) $\vec{A}_x+\vec{B}_x=0$ (b) $\vec{A}_y+\vec{B}_y=0$
(c) Both a and b (d) None of these

98. The resultant of two vectors is zero. What do you deduce about the two vectors?
(a) The two vectors have equal magnitudes.
(b) The two vectors have unequal magnitudes.
(c) The two vectors are at right angle to each other.
(d) All of these

99. The sum and difference of two perpendicular vectors of equal lengths are
(a) Parallel and equal (b) Parallel and unequal
(c) Perpendicular and equal (d) Perpendicular and unequal

100. The resultant of two vectors has maximum magnitude when the added vectors are
(a) Perpendicular to each other (b) Parallel to each other
(c) Anti-parallel to each other (d) Equal in magnitude

101. The resultant of two vectors has minimum magnitude when the added vectors are
(a) Perpendicular to each other (b) Parallel to each other
(c) Anti-parallel to each other (d) Equal in magnitude

102. Two vectors to be combined have magnitudes 60N and 35N. Pick the correct answer from those given below:
(a) 100N (b) 70N
(c) 20N (d) 115N

103. Suppose the sides of closed polygon represent vector arranged head to tail. What is the sum of these vectors?
(a) Negative (b) Positive
(c) Zero (d) None of these

104. Two boats A and Y are traveling in different directions at equal speed. The actual direction of A is towards north but to an observer on B, it is moving towards north-west. The actual direction of boat B is
(a) East (b) West
(c) South east (d) South west

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105. If $\vec{A}_1$ and $\vec{A}_2$ be the two vectors and their cross product is zero, the conditions under which the cross product is zero are given below. Pick the false condition
(a) $|\vec{A}_1| = 0$ (b) $|\vec{A}_2| = 0$
(c) $\theta = 0$ (d) $\theta = \pi/2$

106. If $\vec{A}_1$ and $\vec{A}_2$ are the two vectors and their dot product is zero. Which of the following condition is false for which dot product of $\vec{A}$ and $\vec{B}$ is not zero?
(a) $|\vec{A}_1| = 0$ (b) $|\vec{A}_2| = 0$
(c) $\theta = 0$ (d) $\theta = 90°$

107. If coplanar forces acting on a body form a closed polygon, then the body is said to be
(a) In equilibrium (b) At rest
(c) Rigid (d) None of these

108. A vector has its tail at point (1, 0) and tip at (3, 4). Its position vector is
(a) $4\hat{i} + 4\hat{j}$ (b) $2\hat{i} + 4\hat{j}$
(c) $4\hat{i} + 2\hat{j}$ (d) $8(\hat{i} + \hat{j})$

109. A vector has its tail at point (2, 3) and tip at (2, 6). Its length is
(a) 5 (b) 9
(c) 13 (d) 3

110. The unit vector in the direction of the vector $4\hat{i} + 9\hat{j}$ is
(a) $\frac{2}{3}(\hat{i} + \hat{j})$ (b) $\frac{1}{13}(4\hat{i} + 4\hat{j})$
(c) $\frac{1}{\sqrt{97}}(4\hat{i} + 9\hat{j})$ (d) $\frac{1}{97}(4\hat{i} + 9\hat{j})$

111. The magnitude of vector $5\hat{i} + 3\hat{j}$ is
(a) 8 (b) 39
(c) 6 (d) $\sqrt{34}$

112. A certain vector has a magnitude of 5 and its unit vector is $2\hat{i} + \hat{j}$. The original vector is
(a) $7\hat{i} + 6\hat{j}$ (b) $3\hat{i} + 4\hat{j}$
(c) $10\hat{i} + 5\hat{j}$ (d) $\frac{2}{5}\hat{i} + \frac{1}{5}\hat{j}$

113. A vector has its tail at point (2,-3) and tip at point (0, 3). In which quadrant does the vector lies?
(a) 1st (b) 2nd
(c) 3rd (d) 4th

114. If $\vec{A} = \hat{i} + \hat{j}$ and $\vec{B} = 2\hat{i} - 3\hat{j}$, find in which quadrant the vector $\vec{A} + 2\vec{B}$ lies?
(a) 1st (b) 2nd
(c) 3rd (d) 4th

115. If $\vec{A} = 2\hat{i} - 3\hat{j}$ and $\vec{B} = 2\hat{i} + 3\hat{j}$, in which quadrant does the vector $2\vec{A} - 3\vec{B}$ lies?
(a) 1st (b) 2nd
(c) 3rd (d) 4th

116. If $\vec{A} = 2\hat{i} + 3\hat{j}$ and $\vec{B} = 3\hat{i} - 4\hat{j}$ then the magnitude of the vector $3\vec{A} - 2\vec{B}$ is
(a) 0 (b) 17
(c) 13 (d) 12

117. If $\vec{A} = 2\hat{i} + 3\hat{j}$ and $\vec{B} = 3\hat{i} - 4\hat{j}$ then the vector $3\vec{A} - 2\vec{B}$ makes an angle of ____ with the horizontal.
(a) 0 (b) $\frac{\pi}{4}$
(c) $\frac{\pi}{2}$ (d) π

118. A force of $3\hat{i} + 2\hat{j}$ N acts on a body and it moves from point (0, 0) to (2,3). The work done is
(a) $\sqrt{13}$ J (b) 13 J
(c) 6 J (d) 12 J

119. The three vectors $\hat{i} + \hat{j} + \hat{k}$, $2\hat{i} - 3\hat{j} + \hat{k}$ and $4\hat{i} + \hat{j} - 5\hat{k}$ are
(a) Mutually perpendicular (b) Parallel to each other
(c) Anti-parallel to each other (d) None of these

120. If $\vec{A}_1 = \hat{i} - 2\hat{j}$ and $\vec{A}_2 = 3\hat{i} + 4\hat{k}$ then the projection of $\vec{A}_1$ on $\vec{A}_2$ is
(a) -5 (b) 5
(c) -1 (d) 10

121. If $\vec{A}$ and $\vec{B}$ are 3 units vertically upward and 5 units horizontally rightwards then $\vec{A} \times \vec{B}$ is
(a) 15 units vertically downward
(b) Zero
(c) 15 units vertically upward
(d) 2 units leftward

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122. The force $\vec{F} = 3\hat{i}$ is acting on a body at point $2\hat{j}$. The moment of force about origin is

(a) $3\hat{i}+2\hat{j}$ (b) $\sqrt{13}$

(c) $6\hat{k}$ (d) $\sqrt{13}\hat{k}$

123. The magnitude of dot and cross product of two vectors is $6\sqrt{13}$ and 6 respectively. The angle between the two vectors is

(a) 0° (b) 30°

(c) 60° (d) 90°

124. The angle between the vectors $2\hat{i}$ and $5\hat{j}$ is

(a) 0 (b) $\frac{\pi}{4}$

(c) $\frac{\pi}{2}$ (d) π

125. Which of the following pair of vectors is parallel to each other?

(a) $\hat{i}-2\hat{j}+\hat{k}$, $3\hat{i}+4\hat{k}$ (b) $\hat{i}+\hat{j}+\hat{k}$, $2\hat{i}-3\hat{j}+\hat{k}$

(c) $\hat{i}+2\hat{j}-3\hat{k}, 2\hat{i}+4\hat{j}-6\hat{k}$ (d) None of these

ANSWERS

1.	b	2.	d	3.	b	4.	a	5.	d
6.	b	7.	c	8.	c	9.	c	10.	b
11.	d	12.	b	13.	a	14.	d	15.	d
16.	c	17.	a	18.	d	19.	d	20.	b
21.	d	22.	c	23.	a	24.	d	25.	b
26.	d	27.	d	28.	c	29.	a	30.	a
31.	d	32.	d	33.	b	34.	b	35.	c
36.	c	37.	b	38.	c	39.	a	40.	c
41.	c	42.	d	43.	d	44.	b	45.	b
46.	c	47.	a	48.	b	49.	d	50.	c
51.	d	52.	b	53.	a	54.	a	55.	a
56.	c	57.	b	58	d	59.	b	60.	d
61.	c	62.	c	63.	b	64.	d	65.	a
66.	c	67.	d	68.	d	69.	b	70.	d
71.	c	72.	d	73.	b	74.	b	75.	d
76.	a	77.	b	78.	a	79.	b	80.	b
81.	a	82.	a	83.	c	84.	c	85.	b
86.	b	87.	d	88.	d	89.	c	90.	b
91.	c	92.	a	93.	b	94.	a	95.	b
96.	b	97.	c	98.	a	99.	c	100.	b

101.	c	102.	b	103.	c	104.	b	105.	c
106.	d	107.	a	108.	b	109.	d	110.	c
111.	d	112.	c	113.	b	114.	d	115.	d
116.	b	117.	c	118.	d	119.	a	120.	c
121.	a	122.	c	123.	b	124.	c	125.	c

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WORK, ENERGY AND MOMENTUM

1. A force of 10 N works on a body over a distance of 5 m. The force is analogous to the disarticulation of the body. What is the total work done by the force?
(a) 10 N (b) 20 N
(c) 30 N (d) 50 N

2. The work done by a given force over a given distance is proportional to the cosine of the angle between _____.
(a) The force and the acceleration
(b) The force and the speed
(c) The force and the displacement
(d) None of these

3. The work associated to acceleration is _____.
(a) mar (b) mgh
(c) max (d) None of these

4. According to the work energy theorem, a network sources a change in _____.
(a) Kinetic energy (b) Potential energy
(c) Both a & b (d) None of these

5. Work is defined as force over _____.
(a) Speed (b) Distance
(c) Velocity (d) None of these

6. What is the sign of the work done by gravity on a man's position on a podium?
(a) Zero (b) Maximum
(c) Minimum (d) None of these

7. Kinetic energy of an object in uniform circular motion is _____.
(a) Positive (b) Negative
(c) Constant (d) None of these

8. _____is equal to the sum of the kinetic energy and potential energy.
(a) Total heat energy (b) Total electrical energy
(c) Total mechanical energy (d) None of these

9. _____ is the magnitude of the work done by force acting on a particle directly.
(a) Zero (b) Normal
(c) Maximum (d) Minimum

10. A mass is kept motionless by an external force. All of the following are true except _____.
(a) The internal force may carry out work on the body
(b) The external force may carry out work on the body

(c) The internal force may carry out work on the mass
(d) The external force may carry out work on the mass

11. How much work is executed by gravity on an object of mass m in free fall over a distance of h metres?
(a) mhx (b) mgr
(c) mgh (d) None of these

12. In 10 seconds, elevator picks up a weight of 1000 N over a distance of 10 m at constant velocity. _____ is the average power of the elevator.
(a) 100000 W (b) 10000 W
(c) 1000 W (d) 100 W

13. Frictional force is not a_____.
(a) Centripetal force (b) Conservative force
(c) Normal force (d) None of these

14. The work done by a conventional force over a(an) _____is always zero.
(a) Normal loop (b) Open loop
(c) Closed loop (d) None of these

15. Path independence for conventional forces means that the same work is done over any path between_____.
(a) Eight given points (b) Six given points
(c) Four given points (d) Two given points

16. What is the whole mechanical energy of a mass of 2 kg oscillating on a spring given that the maximum velocity of the mass is 5 m/s and the spring constant is 50 N/m?
(a) 20 J (b) 25 J
(c) 30 J (d) 50 J

17. The law of conservation of energy is described as energy can neither be created nor destroyed but can be_____.
(a) Transformed from one form to another
(b) Disintegrated from one form to another
(c) Created
(d) None of these

18. What is the general equation of potential energy?
(a) mg (hx) (b) mg (h+x)
(c) mgh (d) None of these

19. Joule is a unit of_____.
(a) Potential energy (b) Velocity
(c) Acceleration (d) None of these

20. The kwh is a unit of_____.
(a) Force (b) Work
(c) Viscosity (d) Mass

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21. If the kinetic energy of a player is 625 J, then how fast should he run?
(a) 5 m/s (b) 17 m/s
(c) 19 m/s (d) 21 m/s

22. The amount which has the greatest influence on kinetic energy when a car is moving down the highway is _____.
(a) Velocity (b) Mass
(c) Acceleration (d) None of these

23. If an object has kinetic energy, then it also has _____.
(a) Inclination (b) Momentum
(c) Acceleration (d) None of these

24. According to _____, the total amount of energy remains constant.
(a) Ohm's law
(b) Law of gravitation
(c) Law of conservation of energy
(d) None of these

25. How many joules of energy are in 1 kwh?
(a) 1.6MJ (b) 2.6MJ
(c) 3.6MJ (d) 4.6MJ

26. Zahid consumes energy of 800 J while bringing out a body of mass 40 kg from a dig. Calculate the depth of dig and assume the value of $g = 10\ m/s^2$.
(a) 2 m (b) 7 m
(c) 9 m (d) 10 m

27. In physics, pushing on a rock completes no work except for there is movement in the _____.
(a) Same direction as the force
(b) No force is applied on system
(c) Opposite of the direction of force
(d) None of these

28. If an object is picked up 10 m, it expands a certain amount of potential energy. If the similar object is picked up 20 m then its potential energy increase is _____.
(a) Greater (b) Same
(c) Twice as much (d) Six times as much

29. If 20,000 J of enefgy is required to raise 200 kg of water tank from a road to the top of a house then calculate the height of the house. ($g = 10\ m/s^2$).
(a) 25 m (b) 75 m
(c) 95m (d) 10m

30. In a dam, water falls at the rate of 1000 kg/s from a height of 100 m. Suppose that 60 per cent of the energy of falling water is transformed into electrical energy. The power generated per second is _____.
(a) 588000 W (b) 580000W
(c) 5800000 W (d) None of these

31. The largest momentum as compared to the earth is
(a) A pickup truck speeding along a curved road
(b) A pickup truck speeding along a highway
(c) A truck parked in a parking
(d) None of these

32. The change in momentum is also called _____.
(a) Impulse (b) Constant Speed
(c) Constant velocity (d) None of these

33. _____ stands for the impulse momentum relationship.
(a) Newton's first law (b) Newton's second law
(c) Newton's third law (d) None of these

34. Law of conservation of momentum is closely associated with _____.
(a) Newton's first law (b) Newton's second law
(c) Newton's third law (d) None of these

35. A moving object on which no forces are applied will continue to go with _____.
(a) Constant momentum (b) Constant velocity
(c) Constant acceleration (d) None of these

36. A weighty motorbike and a small car roll down a hill then the weighty motorbike will have _____
(a) Smaller speed (b) Smaller momentum
(c) Greater momentum (d) None of these

37. Momentum is relocated to the land when an apple falls on it. The momentum engrossed by the ground is larger than that of the apple only _____.
(a) If the apple breaks (b) If the apple bounces
(c) If the apple move away from the ground
(d) None of these

38. Two like gliders glide toward each other on an air path. One moves at 1 m / s and the other at 2 m /s. They collide together and stick. The mutual mass is_____.
(a) 1/2 m/s (b) 1/4m/s
(c) 1/5 m/s (d) 1/8m/s

39. Two balls having the identical mass roll toward each other and each collide at the same speed. What is the total momentum of the balls?
(a) Zero (b) Ten

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(d) None of these

(c) Fifty

40. If we lift a 5000 N box with a pulley arrangement, it is noted that for every 1m of rope dragged down, the box rises 0.1 m. So the force wanted to lift it is about _____.
(a) 5 N (b) 50 N
(c) 500 N (d) None of these

41. A revolver was finished of a brawny but very glow material and also that the gunshot is more enormous than the gun itself. Like this weapon, the target would be_____.
(a) Safer than the firearm (b) Hazardous than the firearm
(c) Dangerous than the firearm (d) None of these

42. A shell is fired from cannon. The speed of the shell will be nearly the same as the speed of the recoiling cannon if the _____ equals the mass of the gun.
(a) Mass of both (b) Mass of the cannon
(c) Mass of the bullet (d) None of these

43. Force that picks up the pace of a sky rocket in external space is exerted on the rocket by _____.
(a) Weight of rocket (b) Petrol
(c) Exhaust gases (d) None of these

44. Lagging dashboard in buses are secured from a mishap than nonlagging ones because an occupant hitting the dash has _____.
(a) Decreased momentum (b) Decreased whim
(c) Decreased impact force (d) None of these

45. Evaluated with declining on a stilted floor, a glass may not break when it falls to a carpeted floor because of the _____ to stop.
(a) Short time (b) Long time
(c) Both a & b (d) None of these

46. A heavy van and a small car descending down a hill at the same pace are forced to stop in the same magnitude of time compared to the force that stops the car, the force required to stop the van is _____.
(a) Greater (b) Smaller
(c) Equal (d) None of these

47. A cannon shrinks back from firing a cannonball, so, it has _____ than the ball as the speed of the cannon's recoil is less.
(a) Additional weight (b) Additional momentum
(c) Additional mass (d) None of these

48. A cannonball explosion from cannon with an extensive barrel will have a bigger muzzle velocity because the cannonball obtains a greater_____.
(a) Momentum (b) Impulse

(c) Velocity (d) None of these

49. A 5 kg fish swimming at a pace of 1 m/s gulps an blind 1 kg fish swimming in the direction of it at 4 m/s. The speed of the big fish is _____.
(a) 1/4 m/s. (b) 1/5m/s.
(c) 1/6 m/s. (d) 1/8 m/s.

50. If you push for two hour alongside a stationary wall, you do no _____ on the wall.
(a) Work (b) Rest
(c) Force (d) None of these

51. A job is done leisurely, while an equal job is done rapidly. Both jobs need the same amount of work, but different amounts of _____.
(a) Work (b) Power
(c) Magnitude (d) None of these

52. Asim blows a sheet of paper in above ground and brings it from rest up to a speed of 40 m /s in 0.05 s. If the mass of the paper is 0.01 kg, the force of collision on the paper is about _____.
(a) 4 N (b) 6 N
(c) 8 N (d) 10 N

53. A thing is elevated above the ground ahead a certain amount of potential energy. If the same object is raised twice as high, it gains _____.
(a) Same potential energy
(b) Twice as much potential energy
(c) Thrice as much potential energy
(d) None of these

54. An object that has _____ may have energy because of its place.
(a) Speed (b) Velocity
(c) Kinetic energy (d) Potential energy

55. When a car is stopped then its _____ is distorted to heat.
(a) Angular momentum (b) Potential energy
(c) Kinetic energy (d) None of these

ANSWERS

1.	d	2.	c	3.	c	4.	a	5.	b
6.	a	7.	c	8.	c	9.	a	10.	d
11.	c	12.	c	13.	b	14.	c	15.	d
16.	b	17.	a	18.	c	19.	a	20.	b
21.	a	22.	a	23.	b	24.	c	25.	c
26.	a	27.	a	28.	c	29.	d	30.	a
31.	b	32.	a	33.	b	34.	c	35.	a

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36.	c	37.	b	38.	a	39.	a	40.	b
41.	a	42.	c	43.	c	44.	a	45.	d
46.	a	47.	c	48.	b	49.	c	50.	a
51.	b	52.	c	53.	b	54.	d	55.	c

FLUID DYNAMICS

1. **Which of the following is most complicated?**
   (a) Physics of solids (b) Classic physics
   (c) Physics of static fluids (d) Physics of moving fluids

2. **The analysis of fluid in motion is accomplished by assuming**
   (a) Mass is conserved
   (b) Energy is conserved
   (c) Mass and energy are conserved
   (d) None of these

3. **The equation of continuity is derived by assuming that**
   (a) Mass is conserved (b) Energy is conserved
   (c) Momentum is conserved (d) All of these

4. **The Bernoulli's equation is derived on the basis of**
   (a) Law of conservation of mass
   (b) Law of conservation of energy
   (c) Law of conservation of momentum
   (d) All of these

5. **Which of the following effect between different layers of a flowing fluid is described in terms of viscosity of the fluid?**
   (a) Frictional (b) Compton
   (c) Ion exchange (d) Thermal

6. **The force required by a layer of moving fluid to slide over the neighbouring layer is measured by**
   (a) Resistance (b) Temperature
   (c) Viscosity (d) Surface tension

7. **The viscosity of any liquid or gas _____ zero.**
   (a) May be equal to (b) Always greater than
   (c) Always less than (d) May be less than

8. **The viscosity coefficient is usually denoted by the symbol**
   (a) ρ (b) ξ
   (c) ϵ (d) η

9. **The substances that can flow easily have _____ coefficient of viscosity.**
   (a) Large (b) Small
   (c) Unit (d) Zero

10. **The unit of viscosity is**
    (a) $\frac{Ns}{m^2}$ (b) $\frac{lb_f - hr}{ft^2}$
    (c) Poise (d) All of these

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11. The SI unit of viscosity is
(a) cP (b) Poise
(c) $\frac{Ns}{m^2}$ (d) All of these

12. The dimension of viscosity is
(a) [MLT] (b) $[ML^{-1}T^{-1}]$
(c) $[MLT^{-1}]$ (d) $[ML^2T^{-3}]$

13. Which of the following is the largest unit of viscosity?
(a) P (b) cP
(c) $\frac{Ns}{m^2}$ (d) $\frac{lb_f - s}{ft^2}$

14. Which of the following is the smallest unit of viscosity?
(a) cP (b) P
(c) $\frac{kg}{ms}$ (d) $\frac{lb}{ft.\ sec}$

15. Which of the following has the largest coefficient of viscosity?
(a) Water (b) Ethanol
(c) Honey (d) Grease

16. Which of the following has the smallest coefficient of viscosity?
(a) Air (b) Water
(c) Ethanol (d) Methanol

17. The large retarding force is experienced by the car at high speed due to
(a) Weight (b) Tyres
(c) Air (d) Fuel

18. The viscosity of a fluid is its _____ property.
(a) Fundamental (b) Independent
(c) Dependent (d) All of these

19. The viscosity of liquids generally _____ with temperature.
(a) Increases (b) Decreases
(c) Remains constant (d) All of these

20. The viscosity of gases generally _____ with increase temperature.
(a) Increases (b) Decreases
(c) Remains constant (d) All of these

21. An object moving through a fluid experiences a retarding force called
(a) Frictional force (b) Gravitational force
(c) Electrical force (d) Drag force

22. The drag force increases as the speed of object
(a) Increases (b) Decreases

(c) Is halved (d) None of these

23. The calculated drag force experienced by a moving fluid is usually
(a) Exact (b) Approximate
(c) Large (d) Small

24. Which of the following will experience smaller drag force if they are supposed to be moving with same speed?
(a) Car (b) Boat
(c) Truck (d) Aeroplane

25. The drag force is proportional to
(a) Mass (b) Density
(c) Velocity (d) Weight

26. According to Stoke's law, the droplet of mass 'm' moving through a fluid experiences a drag force 'F' given by the relation
(a) $F = 6\pi\eta rv$ (b) $F = \frac{6\pi rv}{\eta}$
(c) $F = 2\pi\eta rv$ (d) $F = \frac{4\pi rv}{\eta}$

27. The drag force experienced by an object moving through a fluid is proportional to
(a) Radius (b) Velocity
(c) Viscosity (d) All of these

28. At high speeds, the drag force is _____ speed.
(a) A function of (b) Not a function of
(c) Equal to (d) None of these

29. A tiny droplet of water in air accelerates due to the force of
(a) Gravity (b) Viscous drag
(c) Repulsion (d) All of these

30. As the speed of droplet moving in air increases, the drag force on it
(a) Decreases (b) Increases
(c) Is vanished (d) Is doubled

31. The net force acting on a droplet moving in a fluid is equal to
(a) 1 N (b) 0
(c) Weight-drag force (d) $6\pi\eta rv$

32. As the speed of droplet moving in a fluid increases, the drag force on it approaches to
(a) 0 (b) Weight
(c) 1 N (d) None of these

33. The velocity of object when its weight is equal to the drag force is called
(a) Escape velocity (b) Vertical component of velocity

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(c) Exact velocity (d) Terminal velocity

34. When a particle is moving with its terminal velocity in air then the net force acting on it is
(a) 0 (b) 1 N
(c) $6\pi\eta rv$ (d) None of these

35. When the net force acting on a droplet is zero then it moves with acceleration equal to
(a) Terminal velocity (b) $9.8\ m/s^2$
(c) 0 (d) $-9.8\ m/s^2$

36. The terminal velocity of the object moving in a fluid is equal to _____.
(a) $\frac{mg}{6\pi\eta rv}$ (b) $6\pi\eta rv$
(c) $\frac{2K.E}{m}$ (d) $\sqrt{\frac{2K.E}{m}}$

37. Which of the following regarding terminal velocity of a body is false?
(a) It is a velocity at which the weight of body is equal to drag force.
(b) $V_t = \frac{mg}{6\pi\eta rv}$
(c) $V_t = \frac{2gr^2\rho}{9\eta}$
(d) None of these

38. The terminal velocity is _____ to the density of the object.
(a) Directly proportional (b) Inversely proportional
(c) Equal (d) None of these

39. A tiny water droplet of radius 0.1 mm descends through air from a high building. What is its terminal velocity? Given that $\eta = 20\times10^{-9}\ kg/mm.s, \rho = 1\times10^{-6}\ kg/mm^3$ and $g = 10{,}000\ mm/s^2$.
(a) 1.1 mm/s (b) 11 mm/s
(c) 0.11 mm/s (d) 1.1 m/s

40. In how many kinds the flow can be found in fluids?
(a) 2 (b) 3
(c) 4 (d) 1

41. The flow of a fluid can be either
(a) Turbulent or static (b) Laminar or streamline
(c) Turbulent or laminar (d) Laminar or static

42. If every particle that passes through a particle point and moves along the same path as followed by particles which passed that point earlier than the flow is called _____ flow.
(a) Smooth (b) Laminar
(c) Turbulent (d) Any of the above

43. The irregular or unsteady flow of the fluid is called
(a) Smooth flow (b) Laminar flow
(c) Turbulent flow (d) Any of these

44. The steady flow condition is
(a) The flow is irregular.
(b) The flow is turbulent.
(c) The streamlines do not cross each other.
(d) None of these

45. The flow of incompressible fluid is said to be ideal if the flow is
(a) Turbulent (b) Streamline
(c) Static (d) Vigorous

46. At high velocities, the flow of fluid becomes
(a) Ideal (b) Static
(c) Laminar (d) Turbulent

47. When the flow of fluid becomes turbulent, the exact path of the particles of fluid can
(a) Be predicted (b) Not be predicted
(c) Be traced (d) Be found

48. The fluid is said to be incompressible if it has a constant
(a) Mass (b) Volume
(c) Density (d) Temperature

49. The ideal fluid is the fluid that
(a) Is non-viscous (b) Is incompressible
(c) Has a steady motion (d) All of these

50. The most wanted flow in majority of the physical processes is
(a) Static (b) Turbulent
(c) Streamline (d) Laminar

51. The analysis of fluid becomes easier when the flow is
(a) Ideal (b) Laminar
(c) Turbulent (d) Irregular

52. For viscous fluids, the flow is _____ than that for less viscous fluids under the same set of conditions.
(a) Less turbulent (b) Less laminar
(c) Less streamlined (d) Greater

53. Which of the following is called Equation of Continuity?
(a) $F = 6\pi\eta rv$ (b) $F = ma$
(c) $\rho_1 A_1 V_1 = \rho_2 A_2 V_2$ (d) $P + \frac{1}{2}\rho V^2 + \rho gh = \text{constant}$

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54. According to equation of continuity, the product of cross-sectional area of pipe and the fluid speed at any point along the pipe
(a) Is Variable (b) Constant
(c) Decreases (d) Increases

55. The product of cross sectional area of pipe and the fluid speed at any point along the pipe is called
(a) Mass flow rate (b) Pressure
(c) Volumetric flow rate (d) None of these

56. Rotameter is a device used to measure
(a) Viscosity (b) Flow rate
(c) Turbulent (d) Density

57. The unit of flow rate is
(a) kg m/ s (b) m^3/s
(c) $N/m^2 s$ (d) All of these

58. The dimension of flow rate is
(a) $[L^3T^{-1}]$ (b) $[L^2T^{-1}]$
(c) $[L^{-1}T^3]$ (d) $[L^{-1}T^2]$

59. As the water falls from tap, its speed increases and so its cross-sectional area
(a) Becomes double (b) Becomes thrice
(c) Increases (d) Decreases

60. The product of density, cross-sectional area and speed of fluid is called its
(a) Viscosity (b) Pressure
(c) Volumetric flow rate (d) Mass flow rate

61. A fluid is moving in a pipe of cross-sectional area of 0.5 ft^2_____. If volumetric flow rate of fluid is $20\ ft^3/s$ then velocity of fluid in the pipe is
(a) $4\ ft/s$ (b) $10\ ft/s$
(c) $40\ ft/s$ (d) $400\ ft/s$

62. An incompressible fluid is flowing in a pipe of variable cross-sectional area. If the speed of fluid is $4\ ft/Sec$ where the cross-sectional area of the pipe is $5ft^2$ then what is the speed of fluid at the exit? The cross sectional area of the pipe at the end is 10 ft^2.
(a) $2\ ft/s$ (b) $200\ ft/s$
(c) $12.8\ ft/s$ (d) $8\ ft/s$

63. A fluid in a pipe passes through from point 1 to point 2. At point 1, the cross sectional area of pipe is 0.5 ft and the speed of fluid is 2 ft/sec. If 50 lb/ft^3 be the density of fluid as it passes through point 1 then what will be its density at point 2? The cross sectional area of pipe at point 2 is 0.2 ft^2 and the speed of fluid at point 2 is 2.5 ft/s.
(a) $10\ lb/ft^3$ (b) $100\ lb/ft^3$
(c) $50\ lb/ft^3$ (d) $62.4\ lb/ft^3$

64. A water hose discharges 30 kg of water in 60 seconds. If the cross sectional area of hose is $10^{-4}\ m^2$ then what is the speed of water at the outlet? Assume density of water to be 1000 kg/m^3 and that the flow is steady.
(a) 1.6 m/s (b) 16 m/s
(c) 5 m/s (d) 0.5 m/s

65. As fluid moves through a pipe of varying cross sectional area and height, the pressure
(a) Becomes zero (b) Remains constant
(c) Changes (d) Doubles

66. The Bernoulli's equation is a fundamental equation in fluid dynamics that relates _____ to fluid speed and height.
(a) Pressure (b) Temperature
(c) Density (d) Flow rate

67. Which of the following is called Bernoulli's equation?
(a) $\rho_1 A_1 V_1 = \rho_2 A_2 V_2$
(b) $F = 6\pi\eta r v$
(c) $P + \frac{1}{2}\rho V^2 + \rho g h = 0$
(d) $P_1 + \frac{1}{2}\rho V_1^2 + \rho g h_1 = P_2 + \frac{1}{2}\rho V_2^2 + \rho g h_2$

68. Which of the following assumption is made in deriving Bernoulli's equation?
(a) Fluid is incompressible. (b) Fluid is non viscous.
(c) Flow is steady. (d) All of these

69. The work done on a fluid, by the fluid behind it, in moving it through a distance Δx is given by
(a) $mg\,\Delta x$ (b) $-mg\,\Delta x$
(c) $PA\,\Delta x$ (d) $mg\,\Delta x \cos 0$

70. A chimney works best when it is tall and exposed to air currents because it forces the upwards flow of smoke by ___ the pressure.
(a) Reducing (b) Increasing
(c) Removing (d) None of these

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71. A stream of air passing over a tube dipped in a liquid will cause the liquid to _____ in the tube.
(a) Fall (b) Rise
(c) Increase (d) None of these

72. According to the Bernoulli's equation, as the unit volume of fluid falls from a height h_1 to a height h_2, the sum of pressure, K.E. and P.E.
(a) Remains constant (b) Increases
(c) Decreases (d) Becomes constant

73. The work done on the fluid at the _____ of pipe has a negative value.
(a) Upper end (b) Lower end
(c) Middle (d) None of these

74. The speed of efflux is equal to the velocity gained by the fluid in falling through the distance $(h_1 - h_2)$ under the action of gravity. This is called
(a) Bernoulli's Theorem (b) Stoke's Theorem
(c) Torricelli's Theorem (d) Newton's Theorem

75. Torricelli's Theorem is stated by the equation
(a) $P + \frac{1}{2}\rho V^2 + \rho g h = \text{constant}$ (b) $\sqrt{2g(h_1 - h_2)} = V_2$
(c) $V_2 = 2g(h_1 - h_2)$ (d) $V_2 = g\sqrt{2(h_1 - h_2)}$

76. Which of the following device is not used to measure blood pressure?
(a) Stethoscope (b) Sphygmomanometer
(c) Venturi meter (d) None of these

77. By inflating the bag with the sphygmomanometer, the external pressure
(a) Is decreased (b) Is increased
(c) Becomes zero (d) None of these

78. 1 torr is equal to
(a) 14.7 N m^{-2} (b) 133.3 N m^{-2}
(c) 13.33 N m^{-2} (d) 147 N m^{-2}

79. Two boats moving parallel in the same direction are
(a) Repelled by each other (b) Resonated by each other
(c) Pulled towards each other (d) None of these

80. For which position will the maximum blood pressure in the body have the smallest value?
(a) Standing upright (b) Sitting
(c) Lying horizontally (d) Standing on one's head

ANSWERS

1.	d	2.	c	3.	a	4.	b	5.	a
6.	c	7.	b	8.	d	9.	b	10.	d
11.	c	12.	b	13.	d	14.	a	15.	d
16.	a	17.	c	18.	a	19.	b	20.	a
21.	d	22.	a	23.	b	24.	d	25.	c
26.	a	27.	d	28.	b	29.	a	30.	b
31.	c	32.	b	33.	d	34.	a	35.	c
36.	a	37.	d	38.	a	39.	c	40.	a
41.	c	42.	b	43.	c	44.	c	45.	b
46.	d	47.	b	48.	c	49.	d	50.	b
51.	a	52.	a	53.	c	54.	b	55.	c
56.	b	57.	b	58.	a	59.	d	60.	d
61.	c	62.	a	63.	b	64.	c	65.	c
66.	a	67.	d	68.	d	69.	c	70.	a
71.	b	72.	a	73.	b	74.	c	75.	b
76.	a	77.	c	78.	b	79.	b	80.	c

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GRAVITATION

1. The value of gravitational constant is _____.
   (a) 6.6734×10^{-11} N m^2/kg^2 (b) 6.6734×10^{-20} N m^2/kg^2
   (c) 6.6734×10^{-30} N m/kg^2 (d) None of these

2. SI unit of gravitational constant G is _____.
   (a) N m^2kg^3 (b) N m^2kg^{-2}
   (c) N m^2s^{-3} (d) None of these

3. When an article is thrown up, _____ is opposed to the direction of motion.
   (a) The force of gravity (b) The direction of motion
   (c) The force of attraction (d) None of these

4. When a body reaches its maximum height then what is the value of its final velocity?
   (a) Zero (b) mgh
   (c) Maximum (d) None of these

5. _____ grasps the planets in their paths around the sun.
   (a) Gravitational force of attraction
   (b) Electric force of attraction
   (c) Magnetic force of attraction
   (d) None of these

6. Acceleration due to _____ is zero at the centre of the earth.
   (a) Velocity (b) Force
   (c) Attraction (d) Gravity

7. Let the acceleration due to gravity on earth is 10 m/s^2 then the acceleration due to gravity _____ is 1.66 m/s^2.
   (a) On moon (b) On space
   (c) On other planets (d) On galaxies

8. If the distance between two bodies is _____, then the force of pull F between them will be 1/4 F.
   (a) Doubled (b) Half
   (c) One third (d) None of these

9. A stone is plummeted from a rock face. Its speed after it has fallen 100 m is_____.
   (a) 39.6 m/s (b) 44.2 m/s
   (c) 59.6 m/s (d) None of these

10. A ball is thrown up and achieves a greatest height of 100 m. Its initial speed was_____.
    (a) 22.5 m/s (b) 44.2 m/s
    (c) 36.6 m/s (d) 55.5 m/s

11. The acceleration due to gravity of a body poignant alongside gravity is _____.
    (a) 9.8 m/s^2 (b) -9.8 m/s^2
    (c) 10 m/s^2 (d) None of these

12. A quill and a coin released simultaneously from the same height do not reach the ground _____because of the resistance of the air.
    (a) At the same time (b) At the same force
    (c) At the same gravitation (d) At the same speed

13. A stone plunged from the top of a building takes 4 s to contact the ground. What is the height of the building?
    (a) 25.6 m (b) 28.2 m
    (c) 36.8 m (d) 78.4 m

14. What is the weight of an object whose mass is 15 kg at the centre of the earth?
    (a) 100 N (b) 50 N
    (c) Zero (d) 15 N

15. Mass remains constant _____.
    (a) Throughout the moon (b) Throughout the sun
    (c) Throughout the universe (d) None of these

16. What is the weight of an object whose mass is 10 kg on earth?
    (a) 10 N (b) 20 N
    (c) 98 N (d) 100 N

17. The _____ acting on an object flooded in a liquid is buoyant force.
    (a) Net force (b) Increasing force
    (c) Decreasing force (d) None of these

18. Normal force per unit area is named as _____.
    (a) Pressure (b) Drift velocity
    (c) Unprejudiced force (d) Impartial force

19. The mass of a thing whose weight on earth is 196 N is _____.
    (a) 20 kg (b) 40 kg
    (c) 196 kg (d) 200 kg

20. If the mass of a sphere is 5 kg on earth, then what would be its mass on Jupiter?
    (a) 5 kg (b) 50 kg
    (c) 500 kg (d) 5000 kg

21. If the change in the value of g at the elevation h above the surface of the earth is _____ as at a depth x beneath it, then x = 2h.
    (a) Dissimilar (b) Identical
    (c) Different (d) None of these

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22. If g is the acceleration due to gravity of the earth's surface, _____ of an article of mass m raised from the exterior of the earth to a height equivalent to the radius R of the earth is $\frac{1}{2}$mgR.

(a) The increase in the potential energy
(b) The decrease in the potential energy
(c) The increase in the kinetic energy
(d) The decrease in the kinetic energy

23. Suppose a glow planet rotating around an enormous star in a spherical orbit of radius R with a period of revolt T. If the gravitational force of magnetism between the planet and the star is proportional to $R^{-5/2}$, then _____.

(a) T^2 is inversely proportional to $R^{7/2}$
(b) T^2 is a square to $R^{7/2}$
(c) T^2 is proportional to $R^{7/2}$
(d) None of these

24. The evaluation of g at a scrupulous point is 9.8 m/s^2. Assume that the earth unexpectedly reduces in size consistently to half its present size without losing any mass, then the value of g at the similar point will be _____.

(a) 10 m/sec^2 (b) 9.8 m/sec^2
(c) 98 m/sec^2 (d) 196 m/sec^2

25. Suppose that the acceleration because of gravity at earth is g and mass of earth is 90 times that of moon. So, if the radius of earth is four times that of moon, then _____ at the surface of moon will be $\frac{g}{5}$.

(a) The value of acceleration (b) The value of velocity
(c) The value of gravitation (d) None of these

26. Assume that the radius of the earth were to reduce by 1% and the mass remaining the same then the acceleration due to gravity on the earth will _____.

(a) Increase by 4% (b) Increase by 2%
(c) Increase by 1% (d) None of these

27. The distance of two planets from sun is 10^{13} and 10^{12}m respectively. So the relative amount of time period of planet is _____.

(a) $10\sqrt{10}$ (b) $15\sqrt{10}$
(c) $20\sqrt{10}$ (d) $25\sqrt{10}$

28. _____ is directed away from the sun because the radiation released by the sun exercises a pressure on the comet throwing its tail away from the sun.

(a) Newton's first law
(b) Newton's second law

(c) The trail of the comet Halley
(d) None of these

29. Suppose the gravitational force is originated inversely proportional to $r^{5/2}$ in place of r^2; then the potential energy of a particle at a distance r from the centre of the earth would be _____ to $r^{3/2}$.

(a) Equal (b) Directly proportional
(c) Inversely proportional (d) None of these

30. The maximum and minimum distance of a planet moving around the sun in an oval path are established R_1 and R_2 respectively. The time period of the planet is proportional to

(a) $(2R_1 + R_2)^{3/2}$ (b) $(R_1 + 2R_2)^{3/2}$
(c) $(R_1 + R_2)^{3/2}$ (d) $(R_1 - 5R_2)^{3/2}$

31. Suppose that the earth to be standardised globe. Person A travels up in a balloon while person B travels down in a mine. _____ measured by each goes on decreasing.

(a) The E M F force (b) The magnetic field
(c) The gravitational field (d) None of these

32. For a body of mass m, kept at a point in a gravitational field, gravitational force will be _____ to gravitational intensity when m is numerically equal to one.

(a) Equal (b) Equivalent
(c) Unaffected (d) Impervious

33. Consider a body of mass 2 kg is put just close to the surface of the earth. The force with which the body draws the earth towards itself is_____.

(a) 9.8 N (b) 10 N
(c) 19.6 N (d) None of these

34. If the angular velocity of the earth motion increases, then the weight of the body at poles of the earth is_____.

(a) Enlarged (b) Dwindled
(c) Remains constant (d) Converted into zero

35. If R is the radius of earth and g is the acceleration due to gravity then _____ of the earth is $\frac{3g}{4\pi GR}$.

(a) Mean density (b) Mean velocity
(c) Mean gravitational field (d) None of these

36. A person positioning at the equator will fly off if the angular speed of the earth becomes 17 times its _____.

(a) Previous value (b) Proposed value
(c) Present value (d) None of these

37. A reference frame attached to the earth cannot be an inertial frame because the earth is revolving on its _____.

(a) Other axis (b) Own axis

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(c) Inertial frame because Newton's laws are applicable in this frame.
(d) None of these

38. It is true that $G = 6.67 \times 10^{-11}\ Nm^2/kg^2$ and this value throughout the universe _____.
(a) Remains constant
(b) Do not change on space only
(c) Do not change on moon only
(d) None of these

ANSWERS

1.	a	2.	b	3.	a	4.	a	5.	a
6.	d	7.	a	8.	a	9.	a	10.	b
11.	b	12.	a	13.	d	14.	c	15.	c
16.	c	17.	b	18.	a	19.	a	20.	a
21.	b	22.	a	23.	c	24.	b	25.	c
26.	b	27.	a	28.	c	29.	c	30.	c
31.	c	32.	b	33.	c	34.	c	35.	a
36.	c	37.	c	38.	a				

STATIC FRICTION

1. The maximum value of static friction of a body takes place when the friction is _____.
(a) Dynamic (b) Kinetic
(c) Limited (d) None of these

2. An element is resting on an irregular inclined plane with inclination α and the angle of friction λ. The element will be at rest when _____.
(a) $3\alpha \geq 2\lambda$ (b) $2\alpha \geq \lambda$
(c) $\alpha \leq \lambda$ (d) $4\alpha < 6\lambda$

3. A regular stepladder rests in limiting symmetry with its lower end on an uneven horizontal plane and its higher end adjacent to a flat vertical wall. If θ is the angle of inclination of the ladder to the vertical wall and μ is coefficient of friction, then $\tan\theta$ is equal to _____.
(a) 5μ (b) 2μ
(c) 8μ (d) 10μ

4. A body is on the point of descending down an inclined plane under its own weight. If the _____ to the horizontal be 30°, the angle of friction will be 30°.
(a) Inclination of the plane (b) Inclination of the body
(c) Slope of the plane (d) None of these

5. The maximum value of coefficient of friction of a body amid various frictions happens when _____.
(a) The friction is static (b) The friction is kinetic
(c) The friction is limiting (d) The friction is sliding

6. A box of 6 kg rests in deterrent equilibrium on an inclined plane whose slope is 30°. If the plane is elevated to a slope of 60° then the force in kilogram will be _____.
(a) $4\sqrt{3}$ kg (b) $2\sqrt{3}$ kg
(c) $6\sqrt{3}$ kg (d) $8\sqrt{3}$ kg

7. When someone saunters on a bumpy surface then the frictional force exercised by the surface on the person is _____.
(a) Opposite to the direction of his motion
(b) Equivalent to the direction of his motion
(c) Greater than his motion
(d) Vertical to the direction of his motion

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8. **Pushing force building an angle θ to the straight surface is useful on a chunk of weight W put on a horizontal table. If the angle of friction is ϕ then _____ required to move the body is equal to $\frac{W \sin \phi}{\cos(\theta - \phi)}$.**
   (a) The amount of work
   (b) The amount of force
   (c) The amount of kinetic energy
   (d) None of these

9. **_____between two surfaces depends on the normal reaction.**
   (a) Coefficient of static friction
   (b) Coefficient of kinetic friction
   (c) Coefficient of dynamic friction
   (d) None of these

10. **In limiting equilibrium, the force of friction F and normal reaction R are compounded into one solitary force F. If the coefficient of friction is μ then _____.**
   (a) Angle $\cos^{-1} \mu$ is between R and F
   (b) Angle $\sin^{-1} \mu$ is between R and F
   (c) Angle $\tan^{-1} \mu$ is between R and F
   (d) None of these

11. **If the angle of friction is A° then the angle flanked by applied force and force of friction is equal to _____.**
   (a) (30 – A)° (b) (45 – A)°
   (c) (45 + λ)° (d) (90 – A)°

12. **A body is positioned on a plane which is inclined towards horizon at θ°. No external force is applied on it. If it is at rest and just on the point of descending down then θ is equal to _____.**
   (a) Angle of static friction (b) Angle of kinetic friction
   (c) Angle of friction (d) None of these

13. **A body of weight K is positioned on a horizontal surface. If λ be the angle of friction then smallest amount of force required to move the body is _____.**
   (a) W sin λ (b) K sin λ
   (c) W cos λ (d) K cos λ

14. **If a weight W can be maintained on an uneven inclined plane by a force P acting along the plane. Then the ratio _____ is tan ϕ.**
   (a) $\frac{P}{W}$ for the angle of friction ϕ
   (b) $\frac{P}{W}$ for the angle of kinetic friction

   (c) $\frac{P}{W}$ for the angle of equilibrium
   (d) None of these

15. **A body can stay at rest when the friction is _____.**
   (a) Static (b) Equal to force
   (c) Limited (d) Both a and c

16. **A force R is applied to a carcass of weight L. If μ is the coefficient of friction then the body will skate first before toppling if**
   (a) Angle of friction is less than angle off inclination
   (b) Angle of friction is greater than angle of inclination
   (c) $R < \mu L$
   (d) None of these

17. **A force P is exerted on a body of weight W. If O is the point on the edge of the body then body will drop first by descending if**
   (a) Movement of P about O is greater than movement of W about O
   (b) Movement of P about O is less than movement of W about O
   (c) Angle of friction is equal to angle of inclination
   (d) None of these

18. **Resultant of electromagnetic force (i.e. reaction) between two surfaces may act through vertex**
   (a) Without the cone of friction
   (b) Straight to the cone of friction
   (c) Within the cone of friction
   (d) None of these

19. **Polishing a surface may _____.**
   (a) Fix friction (b) Reduce friction
   (c) Damage friction (d) None of these

20. **Friction Opposes _____ and occasionally provides motion.**
   (a) Roughness (b) Smoothness
   (c) Movement (d) None of these

ANSWERS

1.	c	2.	c	3.	b	4.	a	5.	c.
6.	b	7.	b	8.	b	9.	a	10.	c
11.	d	12.	c	13.	b	14.	a	15.	d
16.	a	17.	a	18.	c	19.	b	20.	c

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OSCILLATIONS

SET – I

1. An oscillating system is that in which particles move_____.
   (a) Back and forth (b) To and fro
   (c) Straight (d) None of these

2. _____ acts on the system at equilibrium point of an oscillating system.
   (a) Maximum force (b) Minimum force
   (c) No net force (c) None of these

3. _____ causes oscillatory motion.
   (a) Centripetal Force (b) Centrifugal Force
   (c) Restoring Force (d) None of these

4. _____is a motion in which an article returns to its first position at some later time.
   (a) Simple motion (b) Periodic motion
   (c) Wave motion (d) None of these

5. _____ is the unit of frequency.
   (a) Metre per second (b) Metre per second per second
   (c) Hertz (d) Newton

6. An oscillation is harmonic if the _____ varies with x.
   (a) Positive force (b) Centripetal force
   (c) Restoring force (d) None of these

7. A pendulum does not exhibit _____ motion.
   (a) Centripetal acceleration (b) SHM
   (c) Centrifugal force (d) None of these

8. The period of a pendulum depends on the span of the pendulum and the _____.
   (a) Gravitational speed (b) Gravitational velocity
   (c) Gravitational acceleration (d) None of these

9. Projectile motion is not a _____.
   (a) Wave motion (b) Periodic motion
   (c) Pendulum motion (d) Simple motion

10. Period is defined as the time taken to move
    (a) Half oscillation (b) One oscillation
    (c) Maximum oscillation (d) None of these

11. The angular frequency of a mass spring system with mass 2 kg and spring 8 kg is _____.
    (a) 2 (b) 6
    (c) 10 (d) 15

12. The potential energy of a mass spring system is _____.
    (a) kx (b) kx^2
    (c) kx^3 (d) kx^4

13. At x = 0, a simple harmonic system have the maximum _____.
    (a) Kinetic energy (b) Potential energy
    (c) Heat energy (d) None of these

14. Two equal mass spring systems are set up side by side. Mass one is moved a distance of 1 m, while mass two is displaced a distance of 2 m. Both systems have the _____.
    (a) Opposite period (b) Same period
    (c) Negative period (d) None of these

15. In a torsional oscillator the torque exercised by the wire is proportional to _____.
    (a) Angular speed (b) Angular displacement
    (c) Angular velocity (d) None of these

16. _____ of a given body is calculated by using a torsional oscillator.
    (a) The mass of rigid body (b) The moment of inertia
    (c) The moment of force (d) None of these

17. A mass of 4 kg is swinging on a spring with constant 1 N/m. If its maximum velocity is 3 m/s then its amplitude is _____.
    (a) 4 m (b) 6 m
    (c) 8 m (d) 10 m

18. _____ is not an example of a damping force.
    (a) Space confrontation (b) Kinetic friction
    (c) Potential friction (d) None of these

19. Both damped system and simple harmonic system have _____.
    (a) Irregular frequency (b) Crooked frequency
    (c) Constant frequency (d) None of these

20. The amplitude of a damped system exponentially _____.
    (a) Reduces (b) Dwindles
    (c) Enlarges (d) Widens

21. The frequency of a damped system _____.
    (a) Dwindles (b) Remains constant
    (c) Gets wider (d) Enlarges

22. _____ causes an oscillating system to slow down.
    (a) Centrifugal force (b) Centripetal force
    (c) Damping force (d) None of these

23. The motion of an oscillating system subjected to an external force is described as _____.
    (a) Moisture oscillation (b) Forced oscillation
    (c) Choral motion (d) Interrupted motion

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24. The increasing and decreasing of tides is an example of _____.
(a) Clammy oscillation (b) Forced oscillation
(c) Slimy oscillation (d) Sticky oscillation

25. Resonance happens when the amplitude of the oscillating system.
(a) Increases quickly (b) Diminishes quickly
(c) Weakens quickly (d) None of these

26. Resonance occurs in a system with no damping when the frequency of the driving force is as the _____ usual frequency of the system.
(a) Dissimilar (b) Similar
(c) Unrelated (d) Divergent

ANSWERS

1.	a	2.	c	3.	c	4.	b	5.	c
6.	c	7.	b	8.	c	9.	b	10.	b
11.	a	12.	b	13.	a	14.	b	15.	b
16.	b	17.	b	18.	b	19.	c	20.	a
21.	b	22.	c	23.	b	24.	b	25.	a
26.	b								

SET - II

1. The motion in which a body moves to and fro about a mean position is called
(a) Oscillatory motion (b) Vibratory motion
(c) Both of them (d) None of them

2. In vibratory motion, the body oscillates due to
(a) Restoring force (b) Resistive force
(c) Gravitational force (d) Drag force

3. The restoring force is directed towards
(a) Equilibrium position (b) Left side extreme position
(c) Right side extreme position (d) None of them

4. In oscillatory motion, the acceleration is directed towards
(a) Equilibrium position (b) Left side extreme position
(c) Right side extreme position (d) None of them

5. The restoring force is directly proportional to the displacement of the system from its equilibrium position and is always directed towards it, if the system obeys
(a) Plank's law (b) Hooke's law
(c) Coulomb's law (d) Faraday's law

6. A vibratory motion in which acceleration is directly proportional to the displacement from the mean position and is always directed towards the mean position is known as
(a) Simple harmonic motion (b) Simple geometric motion
(c) Simple arithmetic motion (d) Simple rotary motion

7. The distance of vibrating body from the mean position at any time is known as its
(a) Mean displacement (b) Average displacement
(c) Instantaneous displacement (d) All of them

8. The instantaneous displacement will be zero at
(a) Mean position (b) Extreme position
(c) Both of them (d) None of them

9. The instantaneous displacement will be maximum at
(a) Mean position (b) Equilibrium position
(c) Extreme position (d) All of them

10. Amplitude is maximum value of
(a) Displacement (b) Velocity
(c) Acceleration (d) Force

11. The wave form of SHM is a
(a) Circle (b) Sine curve
(c) Tangent curve (d) Straight line

12. One complete round trip of the body in motion is called
(a) Vibration (b) Displacement
(c) Frequency (d) Time period

13. The motion of the body from its one extreme position back to the same position is called
(a) Vibration (b) Displacement
(c) Frequency (d) Time period

14. The time required to complete one vibration is called
(a) Time period (b) Residence time
(c) Response time (d) All of them

15. The number of vibrations executed by a body in one second is called
(a) Frequency (b) Time period
(c) Displacement (d) None of them

16. The unit of frequency is
(a) Vibrations per second (b) Cycles per second
(c) Hertz (d) All of them

17. The time period of a vibrating body is 0.5 s, the frequency will be
(a) 1 Hz (b) 2 Hz
(c) 3 Hz (d) 4 Hz

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18. The frequency of an oscillating object is 0.2 Hz, its time period will be
(a) 1 s (b) 5 s
(c) 10 s (d) 20 s

19. The dimensions of frequency are
(a) $[MLT^{-1}]$ (b) $[ML^0T]$
(c) $[M^0L^0T^{-1}]$ (d) $[M^0L^0T^0]$

20. The dimensions of angular frequency are
(a) $[MLT^{-1}]$ (b) $[ML^0T]$
(c) $[M^0L^0T^{-1}]$ (d) $[M^0L^0T^0]$

21. The angular frequency of a 500 Hz tuning fork will be
(a) 3141.6 Hz (b) 3411.6 Hz
(c) 3114.6 Hz (d) 3614.1 Hz

22. The angular frequency of a body is 1570.8 Hz. Its period will be
(a) 0.4 s (b) 0.04 s
(c) 0.004 s (d) 0.0004 s

23. The displacement of a body executing SHM is maximum when the phase of vibration is
(a) 0° (b) 45°
(c) 90° (d) 180°

24. The instantaneous velocity of a body executing SHM is maximum when the phase of vibration is
(a) 0° (b) 45°
(c) 90° (d) 135°

25. For a body executing SHM, the instantaneous velocity is maximum when
(a) X = 0 (b) The body is at mean position
(c) Both of them (d) None of them

26. For a body executing SHM, the instantaneous velocity is minimum when
(a) $X = X_0$ (b) The body is at extreme position
(c) Both of them (d) None of them

27. The angle which specifies the displacement as well as the direction of motion of the point executing SHM, is known as
(a) Phase (b) Angle of repose
(c) Critical angle (d) All of them

28. A 2 kg body is attached with the end of a vertically suspended spring. If the spring constant is 200 Nm^{-1}, the period of oscillations is
(a) 0.11 s (b) 0.63 s
(c) 0.98 s (d) 1.21 s

29. Consider a vertically suspended mass spring system, if instantaneous displacement is 0.2 m, amplitude is 0.5 m and velocity at mean position is 0.8 ms^{-1}, the instantaneous velocity will be
(a) 0.16 ms^{-1} (b) 0.32 ms^{-1}
(c) 0.58 ms^{-1} (d) 0.73 ms^{-1}

30. If a 1 kg mass is attached with a vertically suspended spring of constant of 150 Nm^{-1}, the acceleration for 0.5 m displacement will be
(a) -25 ms^{-2} (b) -50 ms^{-2}
(c) -75 ms^{-2} (d) -100 ms^{-2}

31. A block weighing 4 kg extends a spring by 0.16 m from its unstretched position. The period of vibration is 0.28 sec while the frequency of vibration is
(a) 1.2 Hz (b) 2.4 Hz
(c) 3.6 Hz (d) 4.8 Hz

32. If the mass attached to a spring is made four times, the time period will
(a) Be doubled (b) Be four times
(c) Be six times (d) Remains unaffected

33. The acceleration of a 0.2 kg bob attached to a 0.9 m string at a displacement of 0.5 m from the mean position is
(a) −1.1 ms^{-2} (b) -3.2 ms^{-2}
(c) -5.4 ms^{-2} (d) -7.9 ms^{-2}

34. The time period of simple pendulum depends upon
(a) Length of the pendulum (b) Acceleration due to gravity
(c) Both of them (d) None of them

35. The time period of vertically suspended mass spring system depends upon
(a) Mass of the body (b) Spring constant
(c) Both of them (d) None of them

36. If the time period of a pendulum is to be doubled, the length of pendulum is
(a) Doubled (b) Made four times
(c) Made halved (d) Made one fourth

37. The time period of pendulum is independent of
(a) Length (b) Acceleration due to gravity
(c) Mass (d) All of them

38. The length of a simple pendulum with 1 s period is
(a) 0.25 m (b) 0.50 m
(c) 0.75 m (d) 1.00 m

39. A pendulum of 0.50 m length has a period of 1.42 s. Its frequency is
(a) 0.4 Hz (b) 0.5 Hz

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(d) 0.7 Hz

(c) 0.6 Hz

40. The displacement from mean position of a mass spring system is 0.7 m. For a spring constant of 175 kg s^{-2}, the elastic potential energy of the spring is
(a) 21.3 J (b) 33.7 J
(c) 42.9 J (d) 61.2 J

41. For the amplitude of 0.9 m in mass spring system, the maximum potential energy is 100 J. The spring constant is equal to
(a) 147 kgs^{-2} (b) 247 kgs^{-2}
(c) 347 kgs^{-2} (d) 447 kgs^{-2}

42. When a spring of constant of 150 kgs^{-2} is given an amplitude of 0.7 m, the maximum potential energy stored in the spring is
(a) 12.3 J (b) 23.1 J
(c) 36.8 J (d) 44.2 J

43. When a spring of constant of 150 kgs^{-2} is given an amplitude of 0.7 m, it has kinetic energy at mean position equal to
(a) 12.3 J (b) 23.1 J
(c) 36.8 J (d) 44.2 J

44. For any displacement, the total energy gained by a mass spring system is
(a) Partly K.E. (b) Partly P.E.
(c) Both of them (d) None of them

45. The spring of constant of 180 kgs^{-2} can achieve an amplitude of 0.6 m. The total energy of this mass spring system at any instant is
(a) 17.6 J (b) 27.1 J
(c) 32.4 J (d) 41.7 J

46. During the vibration of mass spring system, at mean position
(a) K.E. is minimum (b) K.E. is maximum
(c) P.E. is minimum (d) None of them

47. During the vibration of mass spring system, at extreme position
(a) K.E. is minimum (b) K.E. is maximum
(c) P.E. is minimum (d) None of them

48. For maintaining oscillations, what should vary with displacement?
(a) P.E. (b) K.E.
(c) Both of them (d) None of them

49. The oscillatory systems do not oscillate indefinitely because of
(a) Gravitational force (b) Electrostatic force
(c) Frictional force (d) Electromagnetic force

50. When a body oscillates without the interference of an external force, it is said to be executing
(a) Free oscillations (b) Forced oscillations
(c) Spontaneous oscillation (d) Damped oscillations

ANSWERS

1.	c	2.	a	3.	a	4.	a	5.	b
6.	a	7.	c	8.	a	9.	c	10.	a
11.	b	12.	a	13.	a	14.	a	15.	a
16.	d	17.	b	18.	b	19.	c	20.	c
21.	a	22.	c	23.	c	24.	a	25.	c
26.	c	27.	a	28.	b	29.	d	30.	c
31.	c	32.	a	33.	c	34.	c	35.	c
36.	b	37.	c	38.	a	39.	d	40.	c
41.	b	42.	c	43.	c	44.	c	45.	c
46.	b	47.	a	48.	c	49.	c	50.	a

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WAVES

1. **Waves transport**
   (a) Matter (b) Energy
   (c) Momentum (d) All of these

2. **The energy transportation in waves is accomplished by**
   (a) Matter (b) Medium
   (c) Disturbance (d) All of these

3. **When a musician plucks a guitar string, which type of waves are generated?**
   (a) Musical waves (b) Instrumental waves
   (c) Ocean waves (d) Sound waves

4. **For different kinds of waves, the mechanism of transportation of the energy is**
   (a) Same (b) Different
   (c) May or may not same (d) Must be different

5. **The propagation of waves through space is accomplished by means of**
   (a) Radiations (b) Light
   (c) Oscillations (d) None of these

6. **The waves which propagate by the oscillations of material particles are known as**
   (a) Transverse waves (b) Mechanical waves
   (c) Particle waves (d) Ocean waves

7. **The waves which propagate in space due to the oscillations of electric and magnetic fields are called**
   (a) Mechanical waves (b) Electromagnetic waves
   (c) Longitudinal waves (d) Charged waves

8. **Which of the following is an example of mechanical waves?**
   (a) Ocean waves (b) Sound waves
   (c) Stationary waves (d) All of these

9. **Mechanical waves are actually the effect of ___ oscillations of a very large number of particles of the medium through which the waves are passing.**
   (a) Individual (b) Separate
   (c) Cooperative (d) Independent

10. **The ripples produced in the water due to some disturbance are the examples of**
    (a) Progressive waves (b) Stationary waves
    (c) Electromagnetic waves (d) Sound waves

11. **A wave which transfers energy in moving away from the source of disturbance is called**
    (a) Progressive wave (b) Travelling wave
    (c) Both of the above (d) None of these

12. **How many kinds of progressive waves are there?**
    (a) 2 (b) 3
    (c) 4 (d) 7

13. **A wave is set up in the rope by jerking one end. The medium through which the wave travels is**
    (a) Air (b) Rope
    (c) Space (d) Light

14. **Which of the following is transferred as waves are generated in a rope?**
    (a) Energy (b) Momentum
    (c) Force (d) All of these

15. **The waves in which the particles of the medium vibrate in direction right angle to the direction of propagation of waves are called**
    (a) Transverse waves (b) Longitudinal waves
    (c) Stationary waves (d) Standing waves

16. **The waves in which the particles of the medium vibrate in direction parallel to the direction of propagation of waves are called**
    (a) Transverse waves (b) Longitudinal waves
    (c) Stationary waves (d) Standing waves

17. **Transverse waves usually cannot be set up in**
    (a) Solids (b) Liquids
    (c) Gases (d) Fluid

18. **All kind of progressive waves can be set up in**
    (a) Solids (b) Liquids
    (c) Gases (d) All of these

19. **Sound waves are _____ in nature.**
    (a) Transverse (b) Longitudinal
    (c) Stationary (d) Standing

20. **Electromagnetic waves are _____ in nature.**
    (a) Transverse (b) Longitudinal
    (c) Stationary (d) Compressional

21. **Which of the following is not transverse in nature?**
    (a) Electromagnetic waves (b) Pulse
    (c) Radio waves (d) None of these

22. **Which of the following is longitudinal in nature?**
    (a) Sound waves
    (b) Mass spring system on a horizontal table

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(c) Swing (d) All of these

23. Continuous, regular and rhythmic disturbances cause the generation of
(a) Transverse waves (b) Longitudinal waves
(c) Periodic waves (d) Compressional waves

24. Which of the following cannot be called periodic waves?
(a) Vibrating mass spring system (b) Radio waves
(c) Vibrating pendulum (d) Ocean waves

25. Which of the following does not execute SHM?
(a) Simple Pendulum (b) Vibrating mass spring system
(c) Sound waves (d) None of these

26. The crust or trough is _____ equilibrium position.
(a) Maximum displacement (b) Equal to
(c) Perpendicular to (d) Parallel to

27. The crest is a pattern in which the rope is displaced _____ its equilibrium position.
(b) Below
(c) Equal to (d) Less than

28. The trough is a pattern in which the rope is displaced _____ its equilibrium position.
(a) Above (b) Below
(c) Equal to (d) Greater than

29. The maximum displacement from the mean position is called
(a) Wavelength (b) Amplitude
(c) Frequency (d) Time period

30. Wavelength is defined as
(a) Distance between two consecutive crests
(b) Distance between two consecutive troughs
(c) Both of the above
(d) None of these

31. The time taken for the passage of one complete wave is called
(a) Time period (b) Frequency
(c) Time constant (d) None of these

32. The number of waves passing through a point in 1 s is called
(a) Time period (b) Frequency
(c) Wave number (d) Wave constant

33. Wavelength is usually represented by the symbol
(a) λ (b) γ
(c) η (d) T

34. Frequency is usually represented by the symbol
(a) λ (b) η
(c) γ (d) T

35. The unit of frequency is
(a) Hz (b) cps
(c) Vib/sec (d) All of these

36. Which one of the following is different from others?
(a) Frequency (b) Wavelength
(c) Amplitude (d) Displacement

37. Frequency and time period are related by the relation
(a) $T = \lambda$ (b) $T = \gamma^2$
(c) $T = \frac{1}{\gamma}$ (d) $T^2 = \frac{1}{\gamma}$

38. The speed v of the wave is given by the relation
(a) $v = \frac{s}{t}$ (b) $v = st$
(c) $v = \lambda T$ (d) $v = v\lambda$

39. The time elapsed in moving from crest to trough is equal to
(a) $\frac{T}{4}$ (b) $\frac{T}{2}$
(c) $\frac{3T}{4}$ (d) T

40. The time elapsed in moving from crest to mean position is
(a) $\frac{T}{4}$ (b) $\frac{T}{2}$
(c) $\frac{3T}{4}$ (d) T

41. The time taken in moving from one trough to the neighbour trough is equal to that of moving from one crest to the other crest and is given by
(a) $\frac{T}{4}$ (b) $\frac{T}{2}$
(c) $\frac{3T}{4}$ (d) T

42. The speed of different crests and troughs in a wave pattern is
(a) Different (b) Same
(c) Less (d) Greater

43. Which of the following is not true?
(a) $V = f\lambda$ (b) $V = \frac{\lambda}{T}$
(c) $f = \frac{1}{T}$ (d) None of these

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44. The profile of periodic waves generated by a source executing SHM is represented by
(a) Sine curve (b) Cosine curve
(c) Tan curve (d) Sin^{-1} curve

45. The points on a vibrating medium are always in same phase when the distance between them is
(a) $n\lambda$ (b) $n+\lambda$
(c) $\frac{n\lambda}{2}$ (d) $\left(n+\frac{1}{2}\right)\lambda$

46. If n = 0,1,2,3..... then the points on a vibrating medium are always out of phase when the distance between them is
(a) $n\lambda$ (b) $n+\lambda$
(c) $\frac{n\lambda}{2}$ (d) $\left(n+\frac{1}{2}\right)\lambda$

47. The stretched regions in a vibratory spring are called
(a) Rarefaction (b) Compression
(c) Empty zones (d) Mean points

48. In compressional waves, the particles in the path of waves move back and forth in the direction_____ to the direction of the line of propagation of the wave.
(a) Right angle (b) Parallel
(c) At 60° (d) None of these

49. Which of the following statement is true?
The wavelength is defined as the
(a) Distance between two consecutive troughs
(b) Distance between two consecutive rarefactions
(c) Distance between two consecutive compressions
(d) All of these

50. Sound waves are _____ in nature.
(a) Longitudinal (b) Compressional
(c) Progressive (d) All of these

51. The speed of sound waves in different medium is
(a) Same (b) Different
(c) Equal (d) Constant

52. The speed of sound waves depends on the _____ of the medium through which they are traveling.
(a) Compressibility (b) Inertia
(c) Compressibility and inertia (d) None of these

53. Speed of sound waves is _____ the speed of light.
(a) Less than (b) Greater than
(c) Equal to (d) Relative to

54. Wavelength of sound waves is _____ the wavelength of light.
(a) Less than (b) Greater than
(c) Equal to (d) Relative to

55. The wavelength of sound waves _____ on the medium through which they are traveling.
(a) Depends (b) Does not depend
(c) May depend (d) None of these

56. The wavelength of sound equal to
(a) 1 m (b) 1 cm
(c) 1 μ m (d) 1 nm

57. If the sound waves are traveling through a medium of elastic modulus 'E' and density 'd' then the speed of sound waves is given by
(a) $V=\sqrt{\frac{2\,K.E.}{m}}$ (b) $V=f\lambda$
(c) $V=\sqrt{\frac{E\lambda}{d}}$ (d) $V=\sqrt{\frac{E}{d}}$

58. The speed of sound is _____ in solids than that in gases.
(a) Less (b) Greater
(c) Equal (d) Half

59. In general the sound travels more slowly in gases than in solids because gases are more
(a) Ionized (b) Rigid
(c) Compressible (d) Attractive in nature

60. In general, the gases have elastic modulus _____ that of the solids.
(a) Less than (b) Greater than
(c) Equal to (d) Very close to

61. For the calculation of elastic modulus for air, Newton assumed that when a sound wave travels through air, the temperature of air during compression
(a) Increases (b) Decreases
(c) Remains constant (d) Varies

62. The elastic modules at constant temperature is equal to
(a) $\frac{\Delta P}{\Delta V/V}$ (b) ΔPV
(c) $P\Delta V$ (d) $\frac{\Delta P}{\Delta V}$

63. Newton's formula for the speed of sound in air is given by
(a) $v=\sqrt{\frac{P\Delta V}{d}}$ (b) $v=\sqrt{\frac{P}{d}}$

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(c) $v=\sqrt{\frac{2\,K.E.}{m}}$ (d) $v=\frac{s}{t}$

64. According to the Newton's formula $v=\sqrt{\frac{P}{d}}$, the speed of sound in air is equal to
(a) 3×10^8 m/s (b) 332 m/s
(c) 332 cm/s (d) 280 m/s

65. The speed of sound experimentally found is equal to
(a) 332 m/s (b) 332 cm/s
(c) 280 m/s (d) 3×10^8 m/s

66. The difference between the experimentally found speed of sound and that of found by Newton's formula in air is
(a) 332 m/s (b) 52 m/s
(c) 280 m/s (d) 200 m/s

67. The correction in the Newton's formula for the speed of sound was made by
(a) Laplace (b) Einstein
(c) Young (d) None of these

68. According to Laplace, as the sound travels through a medium, the temperature of the medium does not
(a) Increase (b) Decrease
(c) Vary (d) Remain constant

69. If the temperature of the medium does not remain constant then Boyle's law becomes
(a) PV = constant (b) V/T = constant
(c) PV^{γ} = constant (d) None of these

70. Which of the following statement is true?
(a) $\gamma=PV$ (b) $\gamma=\frac{C_p}{C_v}$
(c) $\gamma=\frac{C_v}{C_p}$ (d) $\gamma=C_pC_V$

71. The corrected formula for the speed of sound is
(a) $v=\sqrt{\frac{E}{d}}$ (b) $v=\sqrt{\frac{E}{P}}$
(c) $v=\sqrt{\frac{\gamma P}{d}}$ (d) $v=\sqrt{\frac{\gamma E}{d}}$

72. For air the value of $\gamma=\frac{C_p}{C_v}$ at STP is equal to
(a) 0.4 (b) 2.4
(c) 3.4 (d) 1.4

73. The audible frequency of sound for human is in the range of
(a) 150 – 150,000 (b) 20 – 2000 Hz
(c) 200 – 20,000 Hz (d) 20 – 20,000 Hz

74. Density of oxygen is 16 times that of hydrogen. What is the ratio of speed of sound in hydrogen to that in oxygen?
(a) 2 (b) 4
(c) 8 (d) 18

75. Speed of sound _____ with respect to the increase in temperature of the medium through which it travels.
(a) Increases (b) Decreases
(c) Remains constant (d) May decrease

76. If 'v_o' be the speed of sound at 0°C in a certain medium then the speed of sound at temperature 't' is given by
(a) $v_t=v_o+0.61t$ (b) $v_t=v_o-0.61t$
(c) $v_t=v_o+1.6t$ (d) $v_t=v_o-1.6t$

77. The temperature at which the velocity of sound in air is two times its velocity at 27°C is
(a) 475 K (b) 1200 K
(c) 1500 K (d) 1650 K

78. Superposition principle of the waves is _____ property.
(a) Additive (b) Multiplicative
(c) Individual (d) Colligative

79. According to superposition principle, which of the following is true?
(a) $\lambda=\lambda_1+\lambda_2+\lambda_3+.....+\lambda_n$ (b) $f=f_1+f_2+f_3+.....+f_n$
(c) $Y=Y_1+Y_2+Y_3+.....+Y_n$ (d) $v=v_1+v_2+v_3+.....+v_n$

80. Which of the following is true regarding the phenomenon of interference?
(a) Two waves of equal frequency traveling in the same direction.
(b) Two waves of different frequency traveling in the same direction.
(c) Two waves of equal frequency traveling in opposite direction.
(d) None of these

81. Superposition of two waves having the same frequency and traveling in the same direction is called
(a) Beats (b) Stationary waves
(c) Supersonic waves (d) Interference

82. CRO is the abbreviation of
(a) Closed radio oscilloscope
(b) Cathode ray oscilloscope
(c) Cadmium radium oscilloscope
(d) None of these

83. The CRO is a device used to
(a) Record sound (b) Amplify sound

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(c) Display input signal into waveform
(d) Traduce signals

84. If two waves interfere in such a way that the compression meets compression or the rarefaction meets rarefaction, the interference is called
(a) Constructive (b) Destructive
(c) Additive (d) None of these

85. Interference of sound has _____ different types.
(a) 2 (b) 3
(c) 4 (d) 5

86. If two sound waves interfere in such a way that the compression of one wave meets the rarefaction of the other wave, the interference is called
(a) Constructive (b) Destructive
(c) Additive (d) None of these

87. Which kind of interference of sound results in pronounced sound?
(a) Constructive (b) Destructive
(c) Additive (d) None of these

88. Which of the following kinds of interference of sound results in a decreased amplitude of sound waves?
(a) Constructive (b) Destructive
(c) Both of the above (d) None of these

89. If n = 0, ±1, ±2, ±3 ....., then the condition of constructive interference can be given as
(a) $\Delta s = (n+1)\lambda$ (b) $\Delta s = n\lambda$
(c) $\Delta s = \frac{n\lambda}{2}$ (d) $\Delta s = \left(n+\frac{1}{2}\right)\lambda$

90. If n = 0, ±1, ±2, ±3, ..., then the condition of destructive interference can be given as
(a) $\Delta s = (n+1)\lambda$ (b) $\Delta s = n\lambda$
(c) $\Delta s = \frac{n\lambda}{2}$ (d) $\Delta s = \left(n+\frac{1}{2}\right)\lambda$

91. A sound wave of frequency 400 Hz is traveling in air at a speed of 320 m/s. The wavelength of sound is
(a) 128000 m (b) 0.8 m
(c) 0.4 m (d) 1.60 m

92. Two tuning forks are sounded together and the number of beats produced per second is 4. The difference of their frequencies is
(a) 1 (b) 2
(c) 3 (d) 4

93. Which of the following pairs are the quantities with the same unit?
(a) Electric potential; gravitational potential
(b) Frequency; activity of radioactive source
(c) Resistance; resistivity
(d) Acceleration due to gravity; weight

94. Which of the following proves that the light is transverse in nature?
(a) Reflection (b) Refraction
(c) Diffraction (d) Polarization

95. Beats are produced as a result of
(a) Diffraction
(b) Resonance
(c) Constructive and destructive interference
(d) Polarization

96. The effect of loading the prongs of a tuning fork with wax is to
(a) Decrease friction (b) Decrease its frequency
(c) Increase its frequency (d) Maintain uniform frequency

97. Speed of sound in air is independent of
(a) Temperature (b) Pressure
(c) Density (d) All of these

98. Mechanical waves motion in an elastic medium is called
(a) Heat (b) Sound
(c) Light (d) X-rays

99. Which of the following property is independent to the remaining other properties?
(a) Wavelength (b) Frequency
(c) Amplitude (d) Speed

100. The wavelength of the signal from a radio transmitter is 1500 m and the frequency is 200 kHz. What is the wave-length for a transmitter operating at 100 kHz? The speed of radio waves is 3×10^8 m/s.
(a) 300 m (b) 1300 m
(c) 360 m (d) 750 m

ANSWERS

1.	b	2.	c	3.	d	4.	a	5.	c
6.	b	7.	b	8.	d	9.	c	10.	a
11.	c	12.	a	13.	b	14.	d	15.	a
16.	b	17.	d	18.	a	19.	b	20.	a
21.	d	22.	d	23.	c	24.	d	25.	c
26.	a	27.	a	28.	b	29.	b	30.	c
31.	a	32.	b	33.	a	34.	c	35.	d

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36.	a	37.	c	38.	d	39.	b	40.	a
41.	d	42.	b	43.	d	44.	a	45.	a
46.	d	47.	a	48.	b	49.	d	50.	d
51.	b	52.	c	53.	a	54.	b	55.	b
56.	a	57.	d	58.	b	59.	c	60.	a
61.	c	62.	a	63.	b	64.	d	65.	a
66.	b	67.	a	68.	d	69.	c	70.	b
71.	c	72.	d	73.	b	74.	b	75.	a
76.	a	77.	b	78.	a	79.	c	80.	a
81.	d	82.	b	83.	c	84.	a	85.	a
86.	b	87.	a	88.	b	89.	b	90.	d
91.	b	92.	d	93.	b	94.	d	95.	c
96.	b	97.	b	98.	b	99.	c	100.	a

DOPPLER EFFECT IN SOUND WAVES AND MUSICAL SOUND

1. **The smallest intensity of the sound to linger audible is _____**
   (a) 10^{-11} W/m^2 (b) 10^{-12} W/m^2
   (c) 10^{-13} W/m^2 (d) 10^{-14} W/m^2

2. **Enhanced musical resonance is produced by an open pipe since it constructs _____.**
   (a) Odd harmonics (b) Even harmonics
   (c) Both a & b (d) None of these

3. **An auto rickshaw producing a pitch of 400 Hz is poignant towards a immobile person with a velocity of 220 m/s. If the velocity of sound is 330 m/s then the frequency of noise heard by the person is _____.**
   (a) 20Hz (b) 40 Hz
   (c) 1200 Hz (d) 2400 Hz

4. **A jet plane having frequency 150 Hz is moving in the direction of a soldier with a velocity of 110 m/s. The frequency listened to the soldier will be _____**
   (a) 225 Hz (b) 250 Hz
   (c) 300 Hz (d) 500 Hz

5. **An audio wave of frequency 840 MHz is launched towards an aeroplane. If reverberation has a frequency 2.8 KHz more than the creative frequency then the velocity of the aeroplane is _____.**
   (a) 0.49 km/s (b) 0.34 km/s
   (c) 0.42 km/s (d) 0.50 km/s

6. **In a record player, a music record is finished to _____, so the pitch increases.**
   (a) Turn slower (b) Turn faster
   (c) Remain unchanged (d) None of these

7. **In an orchestra, the musical resonances of dissimilar instruments are distinguished from one another by which of the following characteristics?**
   (a) Arena (b) Volume
   (c) Quality (d) Pitch

8. **A source of sound creating a tone of frequency 200 Hz goes towards a viewer with a velocity v, equal to the velocity of sound. If the viewer also goes away from the source with the same velocity v, the obvious frequency heard by the spectator is _____.**
   (a) 50 Hz (b) 100 Hz
   (c) 150 Hz (d) 200 Hz

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9. A source of sound S is moving with a velocity 50 m/s in the direction of a motionless spectator. The spectator calculates the frequency of the source as 1000 Hz. What will be the obvious frequency of the source when it is affecting away from the spectator after crossing him. The velocity of sound in the medium is 350 m/s
(a) 750 Hz (b) 850 Hz
(c) 950 Hz (d) 1050 Hz

10. A source of sound and observer are immobile as compared to each other. If _____ varies then apparent frequency will not change.
(a) The velocity of the sound
(b) The speed of the sound
(c) The acceleration of the sound
(d) None of these

11. _____ has objective existence.
(a) Loudness of sound (b) Loudness of a body
(c) Quietness of sound (d) None of these

12. If the standard sound level due to one person is 40 dB then the sound level when 10 people speak at the same time is _____.
(a) 30 dB (b) 50 dB
(c) 70 dB (d) 90 dB

13. Below what circumstances, obvious frequency equals definite frequency of the source due to Doppler effect?
(a) $|\vec{v}_s| = 0$ and $|\vec{v}_o| = 0$ (b) If velocity equals to zero
(c) Both a and b (d) If acceleration equals to zero

14. A sound source is touching towards north generates sound waves of wavelength 50 cm. If the speed of source is 1/4th speed of sound then obvious wavelength of the waves in
(a) North direction is 37.5 cm and south direction is 62.5 cm.
(b) North direction is 62.5 cm and south direction is 37.5 cm.
(c) North direction is 42.5 cm and south direction is 47.5 cm.
(d) North direction is 33.5 cm and south direction is 57.5 cm.

15. A source of resonance and a viewer are stationary relative to each other. If the wind creates blowing from the source towards the onlooker then____
(a) The wavelength and speed of sound change.
(b) The wavelength and velocity of sound change.
(c) The wavelength and acceleration of sound change.
(d) None of these

16. Roaring of a lion produces a sound of _____ and high loudness.
(a) Low pitch (b) High pitch
(c) Normal pitch (d) None of these

17. Buzzing of a mosquito produces a sound of _____ and low loudness.
(a) Low pitch (b) High pitch
(c) Normal pitch (d) None of these

18. Sound level for normal talk at 1 m is _____.
(a) 40 dB (b) 50 dB
(c) 60 dB (d) 120 dB

ANSWERS

1.	b	2.	b	3.	c	4.	a	5.	d
6.	b	7.	c	8.	d	9.	a	10.	b
11.	a	12.	b	13.	a	14.	a	15.	a
16.	a	17.	b	18.	c				

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REFLECTION, REFRACTION & OPTICS

1. Light is a shape of power formed by a _____.
   (a) Luminous object (b) Translucent object
   (c) Dark object (d) None of these

2. The moon is an example of _____ object.
   (a) Incandescent (b) Shimmering
   (c) Luminous (d) Non-luminous

3. The bending of light towards the boundaries of objects is called _____.
   (a) Reflection (b) Viscosity
   (c) Diffraction (d) None of these

4. Yellow light is used in a single slit diffraction test with slit width of 0.6 mm. If _____, then the experimental pattern will divulge no diffraction pattern.
   (a) Yellow light is substituted by X-rays
   (b) Yellow light is combined with X-rays
   (c) Green light is substituted by X-rays
   (d) Black light is substituted by X-rays

5. The incident beam falling on a surface is sent back into the similar medium is identified as _____.
   (a) Schism (b) Reflection
   (c) Combination (d) None of these

6. _____ reflection occurs when light is thrown on a polished surface.
   (a) Regular (b) Irregular
   (c) Mellow (d) Customary

7. An object becomes _____ when it endures customary reflection.
   (a) Invisible (b) Visible
   (c) Bright (d) None of these

8. Photons always propagate with speed c, but light comes into view to travel at a speed diverse from c in an opaque medium. We can explain this fact by _____in the medium introduce a phase change upon reradiation.
   (a) Discharge tube (b) Electron oscillators
   (c) Cathode rays (d) None of these

9. Total internal reflection can happen only when the incident medium is denser than the _____.
   (a) Profound medium (b) Transmitting medium
   (c) Insightful medium (d) Reflective medium

10. The critical angle for an air water interface is about _____.
    (a) 48.8° (b) 52.4°
    (c) 62.4° (d) 72.4°

11. A reflected beam lies in the same plane as_____.
    (a) The incident beam (b) The happening scowls
    (c) The confrontation grimace (d) The unpleasant incident glare

12. _____ function of space and time describes a wave with speed v in the negative x way.
    (a) f (2x 3vt) (b) f (x + vt)
    (c) f (6vt 5x) (d) f (4vt 6x)

13. One cause why the sky looks blue is that blue light is scattered to a greater extent than _____.
    (a) Orange light (b) Green light.
    (c) Red light. (d) None of these

14. According to Maxwell's equations, an electric field changing in time, will create a(an) _____.
    (a) Charge field (b) Electron field
    (c) Magnetic field (d) None of these

15. The wavelength of a photon with energy of 3.6 eV is _____.
    (a) 245 nanometres (b) 345 nanometres
    (c) 445 nanometres (d) 545 nanometres

16. According to_____, the path occupied by a light ray at all times minimizes the time between any two points.
    (a) Michael's principle (b) J. Timothy's principle
    (c) Fermat's principle (d) None of these

17. Images reflected by _____ are always upright.
    (a) A convex mirror (b) A concave mirror
    (c) Simple mirror (d) None of these

18. _____ is also known as concave mirror.
    (a) A diverging mirror (b) A clear mirror
    (c) A converging mirror (d) A cylindrical mirror

19. _____ can experience from both spherical and chromatic aberration.
    (a) Round lenses (b) Simple lenses
    (c) Convex lenses (d) Concave lenses

20. Concave mirrors can experience from _____ but not chromatic aberration.
    (a) Round aberration. (b) Spherical aberration
    (c) Straight aberration (d) None of these

21. Biconvex lens is used in a(an) _____.
    (a) Simple microscope (b) Compound microscope
    (c) Electron microscope (d) None of these

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22. A convex lens is also known as _____.
(a) Converging lens (b) Deviate lens
(c) Opal shape lens (d) None of these

23. The relation between the focal length and radius of curvature of a mirror is _____.
(a) f =R/8 (b) f =R/4
(c) f = R/2 (d) None of these

24. _____ of a concave mirror is forever at right angles to the mirror.
(a) Radius of curvature (b) Radius of sphere
(c) Radius of ball (d) Radius of globe

25. To get _____ with a convex lens, the object must be positioned at more than 2 focal lengths away.
(a) An increased image (b) A diminished image
(c) A long image (d) A short image

26. The images twisted by _____ are virtual, upright and diminished.
(a) Concave lenses (b) Convex lenses
(c) Diverging lenses (d) None of these

27. All _____ are inverted.
(a) Strong images (b) Simple images
(c) Real images (d) Short images

28. Real type of image is that which can be attained on a _____.
(a) Paper (b) Screen
(c) Partition (d) None of these

29. _____incoming a convex lens at all times converge at the principal focus.
(a) Parallel rays of light (b) Equivalent rays of light
(c) Different rays of light (d) None of these

30. In a convex lens, if an object is placed at 2 F then a real and _____ of the same size is obtained.
(a) A very large image (b) Opposite image
(c) Inverted image (d) None of these

31. A convex lens gets in touch with a concave lens. The magnitude of the ratio of their focal lengths is 2/3. If their corresponding focal length is 30 cm then what are their individual focal lengths?
(a) -50, 10 (b) -10, 25
(c) 10, 25 (d) -15, 10

32. Image fashioned by a plane mirror is always and straight.
(a) Genuine (b) Virtual
(c) Actual (d) Authentic

33. An image shaped by a convex mirror is always virtual, erect and _____.
(a) Smaller (b) Larger
(c) Actual (d) None of these

34. If the image formed by a concave mirror is virtual, erect and magnified, then the object is placed between the pole of the mirror and_____.
(a) The focus (b) The centre
(c) In middle of lens (d) None of these

35. An object located 2m from a plane mirror is transferred 0.5 m away from the mirror. What is the distance between the object and the image?
(a) 2.5 m (b) 4.5 m
(c) 5 m (d) 8.5 m

36. Dentists utilise a _____ to spotlight on the tooth of a patient.
(a) Concave mirror (b) Convex mirror
(c) Simple mirror (d) None of these

37. An object is positioned before a concave lens. So the image shaped is _____.
(a) Always upright (b) Always parallel
(c) Always horizontal (d) None of these

38. An item is positioned 1.5 m from a plane mirror. How distant is the image from the person?
(a) 3 m (b) 5 m
(c) 8 m (d) 10 m

39. A ray of light is thrown on a flat surface mirror. If the angle of incidence is 25° then what is the angle of reflection?
(a) 25° (b) 30°
(c) 45° (d) 60°

40. A ray of light is thrown on a flat surface mirror. If the angle of reflection is 50° then what is the angle between the incident ray and the reflected ray?
(a) 30° (b) 60°
(c) 90° (d) 100°

41. What is the angle between the incident and reproduced rays when a ray of light is incident usually on a flat surface mirror?
(a) 0 (b) 45°
(c) 90° (d) 180°

42. Convex mirror has a(an) _____ field of view.
(a) Extensive (b) Constructive
(c) Diminutive (d) Undersised

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43. If the focal length of a concave mirror is 15 cm then its radius of curvature is _____.
(a) 10 cm (b) 30 cm
(c) 50 cm (d) 60 cm

44. _____ gives a real image if the object is positioned beyond focus.
(a) Concave lens (b) Plane lens
(c) Convex lens (d) None of these

45. The bending of a ray of light when it overtakes crookedly from _____ is documented as refraction.
(a) Only first medium (b) One medium to another
(c) Only second medium (d) None of these

46. The unit of power of a lens is _____.
(a) Dioptre (b) Newton
(c) Joule (d) Watt

47. _____ is the power of the lens of focal length of 100cm.
(a) 1 Dioptre (b) 10 Dioptre
(c) 100 Dioptre (d) 1000 Dioptre

48. _____ is an example of a transparent object.
(a) Tissue paper (b) Butter paper
(c) Carbon paper (d) Hard paper

49. Plane mirror is used to construct a_____.
(a) Microscope (b) Telescope
(c) Periscope (d) None of these

50. The piece of the lens through which the ray of light overtakes _____ is called optical centre.
(a) Without suffering divergence
(b) With suffering divergence
(c) Without suffering convergence
(d) With suffering convergence

51. _____larger than unity points out virtual image.
(a) Real magnification (b) A positive magnification
(c) A negative magnification (d) None of these

52. The power of a convex lens of _____is + 2D.
(a) Focal length 50 cm (b) Focal length 100 cm
(c) Focal length 150 cm (d) Focal length 200 cm

53. The image twisted by a concave lens is at all times virtual and _____.
(a) Complete in size (b) Abridged in size
(c) Absolute in size (d) None of these

54. When someone uses a convex lens as a simple magnifying glass, _____ must be placed at a distance less than one focal length.
(a) The object (b) The lens
(c) The image (d) None of these

55. Real images fashioned by solo convex lenses are always _____.
(a) Very small (b) Inverted
(c) Opposite (d) None of these

56. It is proved that the _____is 25 cm.
(a) Least distance of distinct vision
(b) Great distance of vision
(c) Very small distance of vision
(d) None of these

57. Virtual image is created by a(an) _____.
(a) Electron microscope (b) Simple microscope
(c) Compound microscope (d) Simple telescope

58. The magnification of an image of an object 10 centimetres away from a concave mirror of focal length 2 centimetres is _____.
(a) 50 (b) 25
(c) 75 (d) None of these

59. Two skinny lenses of power +5 D and 2 D are positioned in contact with each other. _____ of the amalgamation is 0.33m.
(a) Point of cross action (b) Centre of curvature
(c) Focal length (d) None of these

60. Polarisation is not a result of_____.
(a) Interference effects (b) Diffraction effects
(c) Diffraction grating effects (d) Optical effects

61. In Young's Double slit experiment, _____will serve to increase the separation between the fringes and increase their width.
(a) Increasing the wavelength of light
(b) Decreasing the wavelength of light
(c) Falling the wavelength of light
(d) Lessening the wavelength of light

62. Light reflecting from a dense medium is somewhat polarised in the plane to the incident plane.
(a) Comparable (b) Parallel
(c) Perpendicular (d) None of these

63. Light has _____.
(a) Direction (b) Weight
(c) Positive charge (d) Negative charge

ANSWERS

1.	a	2.	d	3.	c	4.	a	5.	b
6.	a	7.	a	8.	b	9.	b	10.	a
11.	a	12.	b	13.	c	14.	c	15.	b

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16.	c	17.	a	18.	c	19.	d	20.	b
21.	a	22.	a	23.	c	24.	a	25.	b
26.	c	27.	c	28.	b	29.	b	30.	c
31.	d	32.	b	33.	a	34.	a	35.	c
36.	a	37.	a	38.	a	39.	a	40.	d
41.	a	42.	a	43.	b	44.	c	45.	b
46.	a	47.	a	48.	b	49.	c	50.	a
51.	b	52.	a	53.	b	54.	a	55.	b
56.	a	57.	b	58.	b	59.	c	60.	a
61.	a	62.	c	63.	b				

HEAT AND THERMODYNAMICS

1. **The branch of physics which deals with the transformation of heat into other forms of energy is called**
   (a) Electromagnetism (b) Thermodynamics
   (c) Quantum mechanics (d) Plasma physics

2. **Which of the following phenomena supports kinetic theory of gases?**
   (a) Diffusion of gases (b) Mixing of gases
   (c) Brownian motion (d) All of these

3. **According to kinetic theory of gases, a finite volume of gas consists of a very large number of**
   (a) Molecules (b) Ions
   (c) Formula units (d) None of these

4. **According to kinetic theory of gases, the size of the molecules is much smaller than the separation between the**
   (a) Atoms (b) Ions
   (c) Radicals (d) Molecules

5. **According the kinetic theory of gases, the gas molecules are in random motion and may change their direction of motion after every**
   (a) Collision (b) Rarefaction
   (c) Compression (d) Expansion

6. **According to kinetic theory of gases, the collision between gas molecules themselves and with the walls of the container are assumed to be perfectly**
   (a) Elastic (b) Polarized
   (c) Inelastic (d) Stimulated

7. **According to kinetic theory of gases, molecules do not exert force on each other except during**
   (a) Collision (b) Reflection
   (c) Rarefaction (d) Compression

8. **The momentum transferred to the walls of the container per second per unit area due to the continuous collision of molecules of the gas is called**
   (a) Volume of gas (b) Pressure of gas
   (c) Temperature of gas (d) Mass of gas

9. **The pressure exerted by the gas is _____ to the average translational kinetic energy of the gas molecules.**
   (a) Directly proportional (b) Inversely proportional
   (c) Equal (d) None of these

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10. **PV = nRT is mathematical form of**
(a) Ideal gas law (b) Newton's gravitational law
(c) B yle's law (d) Charles's law

11. **Universal gas constant R has the value**
(a) 8.251 J $mol^{-1}K^{-1}$ (b) 8.314 J $mol^{-1}K^{-1}$
(c) 9.872 J $mol^{-1}K^{-1}$ (d) 9.927 J $mol^{-1}K^{-1}$

12. **The value of Boltzman constant k is**
(a) 1.38×10^{-23} JK^{-1} (b) 2.58×10^{-23} JK^{-1}
(c) 6.04×10^{-23} JK^{-1} (d) 8.21×10^{-23} JK^{-1}

13. **_____of an ideal gas is directly proportional to the average translational kinetic energy of gas molecules.**
(a) Absolute temperature (b) Specific volume
(c) Density (d) Critical pressure

14. **The pressure is inversely proportional to volume at constant temperature of the gas. This is known as**
(a) Boyle's law (b) Charles' law
(c) Ideal gas law (d) Robert's law

15. **Volume is directly proportional to absolute temperature of the gas provided pressure is kept constant. This is known as**
(a) Boyle's law (b) Charles' law
(c) Ideal gas law (d) Robert's law

16. **The average translational kinetic energy of molecules in a gas is 6.21×10^{-12} J. The temperature is**
(a) 150 K (b) 225 K
(c) 300 K (d) 335 K

17. **The average speed of chlorine molecule in the air at S.T.P is**
(a) 310 ms^{-1} (b) 461 ms^{-1}
(c) 521 ms^{-1} (d) 617 ms^{-1}

18. **The sum of all forms of molecular energies of a substance is termed as its**
(a) Heat content (b) Work
(c) Enthalpy (d) Internal energy

19. **The molecules of an ideal gas**
(a) Are mere mass point (b) Exert no forces on one another
(c) Both of them (d) None of these

20. **For an ideal gas system, the internal energy is _____ to its temperature.**
(a) Equal (b) Directly proportional
(c) Inversely proportional (d) None of these

21. **When we heat a substance, heat is converted to**
(a) Mass (b) Volume
(c) Density (d) Internal energy

22. **The increase in temperature of the object is an indication of increase in the**
(a) Mass (b) Volume
(c) Density (d) Internal energy

23. **The physical property which does not depend on path but depends on initial and final states of the system is called**
(a) Function of state (b) Order of state
(c) Magnitude of state (d) All of these

24. **The following is a function of state**
(a) Internal energy (b) Enthalpy
(c) Gravitational P.E. (d) All of above

25. **If an amount of heat enters the system, it manifests itself as**
(a) Increase in internal energy
(b) A resulting quantity of worked performed by the system
(c) Both of them
(d) All of these

26. **The general principles which deal with heat energy and its transformation into mechanical energy are known as**
(a) Laws of motion (b) Law of gravity
(c) Laws of optics (d) Law of thermodynamics

27. **What is conventionally positive?**
(a) Heat entering the system (b) Heat leaving the system
(c) Work done on the system (d) All of these

28. **When heat is added to a system, there is an increase in the internal energy due to**
(a) Rise in temperature (b) Rise in pressure
(c) Change in the state (d) All of these

29. **In any thermodynamic process, when heat is added to a system, this energy appears as an increase in the internal energy stored in the system plus the work done by the system on its surroundings. This is known as**
(a) Zeroth law of thermodynamics
(b) First law of thermodynamics
(c) Second law of thermodynamics
(d) Third law of thermodynamics

30. **A gas is enclosed in a cylinder. 42 J of heat is transferred to the cylinder and the cylinder does 32 J of work. The change in internal energy is**
(a) 42 J (b) 32 J
(c) 10 J (d) 6 J

31. **The process which is carried out at constant temperature and hence the condition for the application of Boyle's law on the gas is fulfilled is called**
(a) Isothermal process (b) Adiabatic process

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(c) Isobaric process (d) Isochoric process

32. The mathematical from of isothermal process is
(a) $P_1V_1 = P_2V_2$ (b) $\frac{P_1}{P_2} = \frac{V_1}{V_2}$
(c) $P_1P_2 = V_1V_2$ (d) $\frac{P_1}{V_1} = \frac{P_2}{V_2}$

33. The curve representing Boyle's law is called
(a) Isotherm (b) Isochor
(c) Isobar (d) Adiabat

34. The process in which no heat enters or leaves the system is called
(a) Isobaric process (b) Isochoric process
(c) Isothermal process (d) Adiabatic process

35. Q = W is the mathematical form of
(a) Isobaric process (b) Isochoric process
(c) Isothermal process (d) Adiabatic process

36. W = –ΔU is the mathematical form of
(a) Isobaric process (b) Isochoric process
(c) Isothermal process (d) Adiabatic process

37. The mathematical form of adiabatic process is
(a) PV^γ = constant (b) $P_1V_1^\gamma = P_2V_2^\gamma$
(c) $P_1V_1^\gamma = P_2V_2^\gamma = P_3V_3^\gamma$ (d) All of these

38. The ratio of the molar specific heat of the gas at constant pressure to molar specific heat at constant volume is a constant which is symbolized as
(a) α (b) β
(c) γ (d) θ

39. The curve representing an adiabatic process is called an
(a) Isotherm (b) Adiabat
(c) Isobar (d) Isochor

40. The heat required to raise the temperature of one mole of the substance through 1K is called
(a) Molar specific heat (b) Molar specific work
(c) Molar specific energy (d) Molar specific enthalpy

41. The molar specific heat at constant volume is the amount of heat transfer required to raise the temperature of one mole of the gas through 1K at constant volume and is symbolized by
(a) C_v (b) C_p
(c) C_w (d) C_s

42. Molar specific heat at constant volume is equal to
(a) ΔU.ΔT (b) $\Delta U / \Delta T$

(c) $\Delta T / \Delta U$ (d) None of these

43. When the temperature of a gas system is changed by 30 K and the internal energy of system is changed by 48 J, the molar specific heat of system at constant volume will be
(a) 0.6 J/mol.K (b) 1.0 J/mol.K
(c) 1.6 J/mol.K (d) 2.1 J/mol.K

44. The molar specific heat at constant pressure is the amount of heat transfer required to raise the temperature of one mole of the gas through 1K at constant pressure and it is symbolized by
(a) C_v (b) C_p
(c) C_w (d) C_s

45. Molar specific heat at constant pressure is equal to
(a) $Q_p.\Delta T$ (b) $Q_p / \Delta T$
(c) $\Delta T / Q_p$ (d) None of these

46. When the temperature of a gas system is changed by 30 K by supplying 48 J of heat, the molar specific heat of system at constant pressure will be
(a) 0.6 J/mol.K (b) 1.0 J/mol.K
(c) 1.6 J/mol.K (d) 2.1 J/mol.K

47. $C_p - C_v$ =
(a) 8.314 J/mol.K (b) 8.143 J/mol.K
(c) 8.413 J/mol.K (d) 8.516 J/mol.K

48. $C_p > C_v$ as
(a) $C_p - C_v = R$ (b) $C_v - C_p = R$
(c) $C_p + C_v = R$ (d) $C_p \times C_v = R$

49. Molar specific heat at constant pressure is greater than molar specific heat at constant volume by an amount equal to
(a) Universal gas constant (b) Gravitational constant
(c) Boltzman constant (d) Cavendish constant

50. The process which can be retraced in exactly reverse order, without producing any change in the surroundings is called
(a) Reversible process (b) Non-reversible process
(c) Un-reversible process (d) Irreversible process

51. In the reverse process, the working substance passes through the same stages as in the direct process but the effects which are exactly reversed at each stage are
(a) Thermal (b) Mechanical
(c) Both of them (d) None of these

52. A succession of events which bring the system back to its initial condition is called a
(a) Round (b) Cycle

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(c) Period (d) Interval

53. If in direct process of a reversible process, heat is given to system, in reverse process
(a) Heat will be accumulated in the system
(b) Heat will be given out from the system
(c) More heat will be wanted by the system
(d) None of these

54. A reversible cycles is the one in which all the changes are
(a) Reversible (b) Irreversible
(c) Non-reversible (d) Un-reversible

55. If performed slowly, the following process is practically reversible
(a) Liquefaction (b) Distillation
(c) Explosion (d) Adsorption

56. If a process cannot be retraced in the backward direction by reversing the controlling factors, it is
(a) Reversible process (b) Irreversible process
(c) Non-reversible process (d) Un-reversible process

57. The reason of irreversibility in a process is
(a) Sudden changes
(b) Changes involving friction
(c) Changes involving energy loss
(d) All of these

58. The device which converts thermal energy into mechanical work is called
(a) Heat engine (b) Heat pump
(c) Refrigerator (d) All of these

59. A heat engine consists of
(a) Source (b) Sink
(c) Working substance (d) All of these

60. A heat engine consists of
(a) Hot reservoir (b) Cold reservoir
(c) Working substance (d) All of these

61. The heat engine provides a continuous supply of work as it is made
(a) Non-periodic (b) Non-repeatable
(c) Cyclic (d) All of these

62. The thermal efficiency of petrol engine is
(a) 10 % (b) 25 %
(c) 40 % (d) 60 %

63. The thermal efficiency of diesel engine lies in the range of
(a) 25 – 30 % (b) 35 – 40 %
(c) 40 – 50 % (d) 45 – 60 %

64. It is impossible to devise a process which may convert heat, extracted from a single reservoir, entirely into work without leaving any change in the working system. This is the statement of second law of thermodynamics purposed by
(a) Lord Kelvin (b) Clausius
(c) Joule (d) Robert Boyle

65. A heat engine absorbs 20 J of energy from source and rejects 5 J of energy to sink. The work done by the engine is
(a) 20 J (b) 15 J
(c) 10 J (d) 5 J

66. A heat engine absorbs 50 J of energy and gives 45 J of work. Its efficiency will be
(a) 60 % (b) 70 %
(c) 80 % (d) 90 %

67. A heat engine absorbs heat from a hot reservoir at 650 K and rejects some heat to cold reservoir at 350 K. Its efficiency will be
(a) 0.12 (b) 0.24
(c) 0.38 (d) 0.46

68. A reversible engine works between two temperatures whose difference is 100 K. If it absorbs 746 J of heat from the hot reservoir and rejects 546 J to the cold reservoir, the temperature of the hot reservoir must be
(a) 100 K (b) 273 K
(c) 373 K (d) 410 K

69. A heat engine has the efficiency of 20 %. It performs 100 J of work. The energy rejected to sink to
(a) 100 J (b) 200 J
(c) 300 J (d) 400 J

70. Ice absorbs 3.36×10^5 J kg^{-1} of heat at 0 °C for melting. The change in entropy is
(a) 1.23×10^3 J K^{-1} (b) 2.71×10^3 J K^{-1}
(c) 3.67×10^3 J K^{-1} (d) 4.88×10^3 J K^{-1}

ANSWERS

1	b	2	d	3	a	4	d	5	a
6	a	7	a	8	b	9	a	10	a
11	b	12	a	13	a	14	a	15	b
16	c	17	a	18	d	19	c	20	d
21	d	22	d	23	a	24	d	25	d
26	d	27	a	28	d	29	b	30	c
31	a	32	a	33	a	34	d	35	c
36	d	37	d	38	c	39	b	40	a
41	a	42	b	43	c	44	b	45	b

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46	c	47	a	48	a	49	a	50	a
51	c	52	b	53	b	54	a	55	a
56	b	57	d	58	a	59	d	60	d
61	c	62	b	63	b	64	a	65	b
66	d	67	d	68	c	69	d	70	a

CURRENT ELECTRICITY

1. **Rate of flow of electric charge is called**
   (a) Electric current (b) Voltage
   (c) Resistance (d) Conductance

2. **SI unit of current is**
   (a) Ampere (b) Coulomb
   (c) Volt (d) Newton

3. **The current due to flow of charge at the rate of one coulomb per second is called**
   (a) Ampere (b) Coulomb
   (c) Volt (d) Newton

4. **The motion of electric charge which causes an electric current is due to the flow of charge**
   (a) Carriers (b) Barriers
   (c) Junctions (d) None of them

5. **In metallic conductors e.g. copper wire, the charge carrier is**
   (a) Electrons (b) Protons
   (c) Ions (d) Atoms

6. **The charge carriers in electrolyte are**
   (a) Positive ions (b) Negative ions
   (c) Both of them (d) None of them

7. **The charge carriers in NaCl solution are**
   (a) Na+ ions (b) Cl– ions
   (c) Both of them (d) None of them

8. **In gases, the charge carriers are**
   (a) Electrons (b) Ions
   (c) Both of them (d) None of them

9. **The current which passes from a point at higher potential to a point at a lower potential as if it represents a movement of positive charges is called**
   (a) Conventional current (b) Electronic current
   (c) Critical current (d) Absolute current

10. **The current which passes from a point at higher potential to a point at a lower potential as if it represents a movement of electrons is called**
    (a) Conventional current (b) Electronic current
    (c) Critical current (d) Absolute current

11. **The valence electrons which are free to move about within the metal body are known as**
    (a) Rigid electrons (b) Free electrons

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(c) Metallic electrons (d) Conventional electrons

12. Upon application of voltage, the free electrons start moving in a direction which make an angle of _____ with electric field strength.
(a) 0° (b) 45°
(c) 90° (d) 180°

13. The direction of drift velocity is _____ to the electric field strength.
(a) Parallel (b) Anti-parallel
(c) Perpendicular (d) At 45°

14. The free electrons move in a metallic conductor by the application of potential difference with a uniform velocity known as
(a) Drift velocity (b) Terminal velocity
(c) Escape velocity (d) Critical velocity

15. The drift velocity is of the order of
(a) 10^{-3} ms^{-1} (b) 10^{-2} ms^{-1}
(c) 10^{-1} ms^{-1} (d) 10^{0} ms^{-1}

16. How many electrons pass through a conductor in 10^{-6} sec if 1.6×10^{-6} A current is flowing through it?
(a) 10^{5} (b) 10^{6}
(c) 10^{7} (d) 10^{8}

17. A device which converts some non-electrical energy into electrical energy is known as
(a) Source of current (b) Source of resistance
(c) Source of charge (d) None of them

18. Cells convert _____ energy into electrical energy.
(a) Chemical (b) Mechanical
(c) Heat (d) Solar

19. Electric generator converts _____ energy into electrical energy.
(a) Chemical (b) Mechanical
(c) Heat (d) Solar

20. A thermocouple converts ____energy into electrical energy.
(a) Chemical (b) Mechanical
(c) Heat (d) Solar

21. A solar cell converts ____ energy into electrical energy.
(a) Chemical (b) Mechanical
(c) Heat (d) Solar

22. Which of following is an effect of electric current?
(a) Heating effect (b) Magnetic effect
(c) Chemical effect (d) All of them

23. When electric current passes through a wire, the kinetic energy of _____ is converted into heat due to collision.
(a) Atoms (b) Molecules
(c) Free electrons (d) All of them

24. Heat produced by an electric current through a wire is directly proportional to
(a) Square of current (b) Resistance
(c) Time (d) All of them

25. If the amount of current through the wire is doubled, the heat produced will be
(a) Halved (b) Unchanged
(c) Doubled (d) Four times

26. If the resistance of the wire is reduced to half, the heat produced will be
(a) Halved (b) Unchanged
(c) Doubled (d) Four times

27. If 2 A current is passed through a wire of 1 ohm resistance for 2.5 s, how much heat will be lost?
(a) 2 J (b) 4 J
(c) 10 J (d) 16 J

28. The heating effect of current is utilized in
(a) Electric heater (b) Toaster
(c) Electric iron (d) All of them

29. The strength of magnetic field due to passage of electric current depends upon
(a) Value of current
(b) Distance from the current element
(c) Both of them
(d) None of them

30. Magnetic effect of electric current is utilized in
(a) Detection of current (b) Measurement of current
(c) Electric motors (d) All of them

31. The study of production of electric current due to chemical reactions is known as
(a) Photosynthesis (b) Electrolysis
(c) Osmosis (d) Optics

32. The process of electrolysis of a liquid depends upon
(a) Nature of the liquid (b) Quantity of the current passed
(c) Both of them (d) None of them

33. The liquid which conducts current is known as
(a) Zeolite (b) Cryolite
(c) Electrolyte (d) None of them

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34. The wire or plate which leads the current into or out of the electrolyte is known as
(a) Electrode (b) Node
(c) Anti-node (d) None of them

35. The electrode connected with the positive terminal of the current source is called
(a) Anode (b) Cathode
(c) Node (d) Anti-node

36. The electrode connected with the negative terminal of the current source is called
(a) Anode (b) Cathode
(c) Node (d) Anti-node

37. The vessel containing the two electrodes and the electrolyte is known as
(a) Rotameter (b) Voltameter
(c) Voltmeter (d) Ammeter

38. In a voltameter containing dilute solution of copper sulphate, a copper plate is used for making
(a) Anode (b) Cathode
(c) Both of them (d) None of them

39. A process of coating a thin layer of an expensive metal on an article of a cheap metal is known as
(a) Electroplating (b) Grinding
(c) Benefication (d) Screening

40. Electroplating utilizes _____ effect of current.
(a) Heating (b) Cooling
(c) Magnetic (d) Chemical

41. The current flowing through a conductor is directly proportional to the potential difference across its ends provided the physical state of the conductor remains constant. This is the statement of
(a) Ohm's law (b) Ampere's law
(c) Joule's law (d) Coulomb's law

42. Mathematical form of Ohm's law is
(a) $I \alpha V$ (b) $V \alpha I$
(c) $V \alpha R$ (d) $I \alpha 1/V$

43. V = RI, the driving force in the expression is
(a) V (b) R
(c) I (d) None of them

44. V = RI, the term showing the flow under the driving force in the expression is
(a) V (b) R
(c) I (d) None of them

45. V = RI, the term showing the resistance to flow under the driving force in the expression is
(a) V (b) R
(c) I (d) None of them

46. V = RI, the value of the resistance 'R' depends upon
(a) Nature of conductor (b) Dimensions of conductor
(c) Physical state of conductor (d) All of them

47. The measure of the opposition to the motion of electrons due to their continuous bumping with atoms of the lattice is called
(a) Potential difference (b) Resistance
(c) Current (d) Electric charge

48. The SI unit of resistance is
(a) Ohm (b) Volt
(c) Ampere (d) Coulomb

49. A conductor has a resistance of 1 _____ if a current of 1 ampere flows through it when a potential difference of 1 volt is applied across its ends.
(a) Ohm (b) Coulomb
(c) Farad (d) Joule

50. If 50 volts of potential difference is applied across a conductor and 2.5 ampere current pass through it, the resistance of the conductor is
(a) 10 ohms (b) 20 ohms
(c) 30 ohms (d) 40 ohms

51. The graph of V versus I is _____ for a conductor obeying Ohm's law.
(a) Circle (b) Parabola
(c) Hyperbola (d) Straight line

52. A conductor which strictly obeys Ohm's law is called
(a) Amperic (b) Voltic
(c) Ohmic (d) Coulombic

53. The example of non-ohmic device is
(a) Bulb filament (b) Electric heater rod
(c) Semi conductor diode (d) All of them

54. Change of resistance of conductor due to temperature change is a reason of
(a) Ohmic behaviour (b) Amperic behaviour
(c) Magnetic behaviour (d) Non-ohmic behaviour

55. If the resistors are connected end-to-end such that the same current passes through all of them, they are said to be connected in
(a) Parallel (b) Series
(c) Perpendicular (d) Symmetrical

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56. For a series combination of resistors, what parameter is same for all resistors?
(a) Resistance (b) Current
(c) Potential difference (d) All of them

57. For what combination of resistors, the equivalent resistance is greater than each resistance in the combination?
(a) Parallel (b) Series
(c) Perpendicular (d) Symmetrical

58. If the resistors are connected side by side with their ends joined together at common points, they are said to be connected in
(a) Parallel (b) Series
(c) Perpendicular (d) Symmetrical

59. For a parallel combination of resistors, what parameter is same for all resistors?
(a) Resistance (b) Current
(c) Potential difference (d) All of them

60. For what combination of resistors, the equivalent resistance is smaller than each resistance in the combination?
(a) Parallel (b) Series
(c) Perpendicular (d) Symmetrical

61. If we double the length of the conductor, its resistance will be
(a) Doubled (b) Four times
(c) Halved (d) Unchanged

62. If we double the cross-sectional area of the conductor, its resistance will be
(a) Doubled (b) Four times
(c) Halved (d) Unchanged

63. If we half the radius of the conductor, its resistance will be
(a) Doubled (b) Four times
(c) Halved (d) Unchanged

64. The resistance of a metre cube of a material is called
(a) Resistivity (b) Specific resistance
(c) Both of them (d) None of them

65. The unit of resistivity is
(a) Ohm-meter (b) Ohm-second
(c) Ohm-volt (d) Ohm-coulomb

66. The reciprocal of resistance is called
(a) Conductance (b) Conductivity
(c) Resistivity (d) Specific resistance

67. The unit of conductance is
(a) mho (b) Siemen
(c) Both of them (d) None of them

68. The reciprocal of resistivity is called
(a) Conductance (b) Conductivity
(c) Specific resistance (d) None of them

69. The SI unit of conductivity is
(a) ohm–1 m–1 (b) mho m–1
(c) Both of them (d) None of them

70. The resistivity of iron is $11 \times 10–8\ \Omega$m. The resistance of 2 m long iron wire having 0.04 m2 cross-sectional area is
(a) $2.75 \times 10–6\ \Omega$ (b) $3.25 \times 10–6\ \Omega$
(c) $4.00 \times 10–6\ \Omega$ (d) $4.55 \times 10–6\ \Omega$

71. A source of 5 V emf having 0.25 Ω internal resistance will give maximum output power equal to
(a) 5 W (b) 25 W
(c) 37 W (d) 55 W

72. According to Kirchhoff's first rule, the sum of all the____ meeting at a point in the circuit is zero.
(a) Currents (b) Voltages
(c) Potential changes (d) Resistances

73. According to Kirchhoff's first rule, the sum of all the currents following towards a point is equal to the sum of all the currents following away from the point. This law is a manifestation of law of conservation of
(a) Mass (b) Energy
(c) Momentum (d) Charge

74. Kirchhoff's second rule states that the algebraic sum of _____ changes in a closed circuit must be equal to zero.
(a) Current (b) Charge
(c) Voltage (d) Energy

75. The work done on a unit positive charge or energy gained or lost by it in moving from one point to the other is known as
(a) Voltage change (b) Potential difference
(c) Both of them (d) None of them

76. Potential difference is usually measured by an instrument called
(a) Voltmeter (b) Ammeter
(c) Rheostat (d) Avometer

77. An ideal voltmeter has resistance equal to
(a) 0 Ω (b) 100 Ω
(c) 1000 Ω (d) Infinity

78. Which of the following instruments measure voltage?
(a) Digital voltmeter (b) Cathode ray oscilloscope
(c) Potentiometer (d) All of them

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79. Which of the following voltage measuring devices draw no current from the circuit?
(a) Digital voltmeter (b) Cathode ray oscilloscope
(c) Both of them (d) None of them

80. The successive resistances in a Wheatstone bridge circuit are X, 2,2 and 4 ohms. The value of X is
(a) 1 ohm (b) 2 ohms
(c) 4 ohms (d) 8 ohms

ANSWERS

1.	a	2.	a	3.	a	4.	a	5.	a
6.	c	7.	c	8.	c	9.	a	10.	b
11.	b	12.	d	13.	b	14.	a	15.	a
16.	c	17.	a	18.	a	19.	b	20.	c
21.	d	22.	d	23.	c	24.	d	25.	d
26.	a	27.	c	28.	d	29.	a	30.	d
31.	b	32.	c	33.	c	34.	a	35.	a
36.	b	37.	b	38.	c	39.	a	40.	d
41.	a	42.	a	43.	a	44.	c	45.	b
46.	d	47.	b	48.	a	49.	a	50.	b
51.	d	52.	c	53.	d	54.	d	55.	b
56.	b	57.	b	58.	a	59.	c	60.	a
61.	a	62.	c	63.	b	64.	c	65.	a
66.	a	67.	c	68.	b	69.	c	70.	a
71.	b	72.	a	73.	d	74.	c	75.	c
76.	a	77.	d	78.	d	79.	c	80.	a

ELECTRIC CURRENT AND OHM'S LAW

1. When 'n' resistances with each one of value 'r' are associated in parallel, then resultant resistance is 'x'. When same resistances are connected in _____, total resistance is n^2 x.
(a) Series (b) Parallel
(c) Opposite (d) None of these

2. Suppose that a resistance of a wire is r ohms. If the wire is _____, then its resistance in ohms is 4 r.
(a) Prolonged to double its size
(b) Prolonged to double its length
(c) Prolonged to double its width
(d) None of these

3. An electron of mass 'm' kg and having a charge of 'e' coulombs travels from rest through a potential difference of 'V' volts. Its kinetic energy will be_____ Joules.
(a) Electron volt (b) Mega electron volt
(c) Joules per second (d) None of these

4. The charge on an electron is _____ coulombs.
(a) 1.6×10^{17} (b) 1.6×10^{18}
(c) 1.6×10^{19} (d) 1.6×10^{21}

5. _____could be the unit of charge.
(a) Metre per second per second (b) Metre per second
(c) Radiant per second (d) Ampere second

6. _____of a wire depends on material.
(a) Region (b) Resistivity
(c) Thinness (d) Thickness

7. A circuit has two unequal resistances in parallel, potential difference across each is_____.
(a) Large (b) Opposite
(c) Same (d) None of these

8. _____is roughly 1840 times greater than the mass of an electron.
(a) The mass of neutron (b) The mass of electron
(c) The mass of proton (d) None of these

9. The _____of an atom is of the order of 10^{-14}m.
(a) Width of the nucleus (b) Length of the nucleus
(c) Extent of the nucleus (d) None of these

10. _____of electrical energy is the same as 36×10^5 joules.
(a) One mega joule (b) Radiant per second
(c) One kilowatt hour (d) None of these

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ELECTRONICS

1. **The most commonly semiconductor is**
   (a) Ge (b) Si
   (c) C (d) P

2. **A P-N junction is formed when silicon or germanium is doped with**
   (a) Trivalent impurity (b) Pentavalent impurity
   (c) Both of the above (d) None of these

3. **The chargeless region around a p-n junction in which charge carriers are not present is called**
   (a) Free region (b) Neutral region
   (c) Empty junction (d) Depletion region

4. **Potential difference developed across the depletion region is called**
   (a) Stopping potential (b) Depletion potential
   (c) p-n potential (d) Potential barrier

5. **The potential barrier of silicon is**
   (a) 1 V (b) 0.7 V
   (c) 0.5 V (d) 0.3 V

6. **The potential barrier in germanium p-n junction is**
   (a) 1 V (b) 0.7 V
   (c) 0.5 V (d) 0.3 V

7. **The potential difference developed across the p-n junction**
   (a) Accelerate the diffusion of electrons into p-junction
   (b) Accelerate the diffusion of holes into n-junction
   (c) Stops the diffusion of electrons into p-region
   (d) All of these

8. **When an external potential difference is applied across a p-n junction such that the p-side is made more positive and n-side more negative then the p-n junction is said to be**
   (a) Forward biased (b) Reversed biased
   (c) Positively biased (d) Negatively biased

9. **If forward bias voltage is increased, the current following through the p-n junction**
   (a) Increases (b) Decreases
   (c) Becomes zero (d) Becomes infinite

10. **The ratio of the change in forward bias voltage to the change in current following through the p-n junction is called _____of the p-n junction.**
   (a) Depletion ratio (b) P-n resistance
   (c) Forward resistance (d) Backward resistance

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ANSWERS

1.	a	2.	b	3.	a	4.	c	5.	d
6.	b	7.	c	8.	c	9.	a	10.	c

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ANSWERS

1.	a	2.	b	3.	a	4.	c	5.	d
6.	b	7.	c	8.	c	9.	a	10.	c

ELECTRONICS

1. **The most commonly semiconductor is**
   (a) Ge (b) Si
   (c) C (d) P

2. **A P-N junction is formed when silicon or germanium is doped with**
   (a) Trivalent impurity (b) Pentavalent impurity
   (c) Both of the above (d) None of these

3. **The chargeless region around a p-n junction in which charge carriers are not present is called**
   (a) Free region (b) Neutral region
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   (a) 1 V (b) 0.7 V
   (c) 0.5 V (d) 0.3 V

7. **The potential difference developed across the p-n junction**
   (a) Accelerate the diffusion of electrons into p-junction
   (b) Accelerate the diffusion of holes into n-junction
   (c) Stops the diffusion of electrons into p-region
   (d) All of these

8. **When an external potential difference is applied across a p-n junction such that the p-side is made more positive and n-side more negative then the p-n junction is said to be**
   (a) Forward biased (b) Reversed biased
   (c) Positively biased (d) Negatively biased

9. **If forward bias voltage is increased, the current following through the p-n junction**
   (a) Increases (b) Decreases
   (c) Becomes zero (d) Becomes infinite

10. **The ratio of the change in forward bias voltage to the change in current following through the p-n junction is called _____of the p-n junction.**
   (a) Depletion ratio (b) P-n resistance
   (c) Forward resistance (d) Backward resistance

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11. When the external source of voltage is applied across a p-n junction such that its positive terminal is connected to n-region and negative terminal is connected to p-region, the p-n junction is said to be
(a) Forward biased (b) Reversed biased
(c) Positively biased (d) Negatively biased

12. When the p-n junction is reverse biased then the current flowing through the p-n junction due to majority charge carrier is
(a) 0 (b) Very small
(c) Very large (d) 1A

13. The current following across the p-n junction due to minority charge carriers when it is reverse biased is called
(a) Forward current (b) Negative current
(c) Minority current (d) Leakage current

14. When the current in reverse biased p-n junction has reached the saturation value, then if the reverse voltage is increased then the reverse current
(a) Increases (b) Decreases
(c) Remains constant (d) Becomes infinite

15. P-n junction is also known as
(a) Transistor (b) Amplifier
(c) Rectifier (d) Semi-conductor diode

16. Conversion of alternating current into direct current is called
(a) Amplification (b) Biasing
(c) Modulation (d) Rectification

17. Which of the following is used for rectification?
(a) Ammeter (b) Voltmeter
(c) Generator (d) Semi-conductor diode

18. Rectification is of _____types.
(a) 2 (b) 3
(c) 4 (d) 6

19. When only one half of alternating current cycle is converted into direct current it is called
(a) Half rectification (b) Full rectification
(c) Half-wave rectification (d) Full-wave rectification

20. In half wave rectification, the diode is forward biased during the interval
(a) $0-\frac{T}{4}$ (b) $0-\frac{T}{2}$
(c) $0-\frac{3T}{4}$ (d) $0-T$

21. In half wave rectification, the diode is reverse biased during the interval
(a) $0-\frac{T}{4}$ (b) $\frac{T}{4}-\frac{T}{2}$
(c) $\frac{T}{2}-T$ (d) $\frac{T}{2}-\frac{3T}{4}$

22. The output signal of current in half-wave rectifier is
(a) Zero (b) In pulses
(c) Smooth (d) In wave from

23. When complete cycle of the alternating current is converted into direct current, it is called
(a) Combine rectification (b) Half-wave rectification
(c) Full-wave rectification (d) Amplification

24. In full wave rectification the circuit consists of _____diodes.
(a) 2 (b) 3
(c) 4 (d) 5

25. The direction of current flowing through the load resistance in full wave rectification is _____ in the two half cycles.
(a) Same (b) Different
(c) Opposite (d) Perpendicular

26. The output voltage in full wave rectification is
(a) Zero (b) Smooth
(c) Pulsating (d) Very large

27. The circuit used for smoothing the output voltage of full wave rectification is called
(a) Filter (b) Amplifier
(c) Transistor (d) Diode

28. The semi-conductor diode in which the potential barrier between P and n sides is such that when an electron combines with a hole during forward biased conduction, a photon of visible light is emitted is called
(a) Transistor (b) LED
(c) Photodiode (d) Photovoltaic cell

29. Light emitting diodes are made from special semi-conductors such as
(a) Germanium phosphide (b) Carbon arsenide
(c) Silicon phosphide (d) Gallium arsenide

30. LED is commonly used as
(a) An amplifier (b) Small light source
(c) A photoelectric cell (d) All of these

31. A specially formed array of _____LED's is used for displaying digits in electronic appliances.
(a) 2 (b) 4

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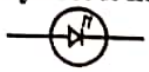
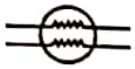
(c) 7 (d) 10

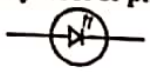
32. The symbol of LED is

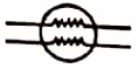
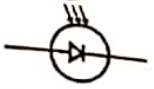
(a)  (b)

(c)  (d)

33. Which of the following is used to detect light?
(a) LED (b) Photovoltaic cell
(c) Photodiode (d) Transistor

34. The symbol of photodiode is

(a)  (b)

(c)  (d) 

35. Photodiode operates in _____conditions.
(a) Forward biased (b) Reverse biased
(c) Both of the above (d) None of these

36. In photodiode the reverse current increases with
(a) Time (b) Reverse biasing
(c) Forward biasing (d) Intensity of light

37. Which of the following is an application of photo diodes?
(a) Automatic switching
(b) Logic circuits
(c) Optical communication equipment
(d) All of these

38. The p-n junction in which potential barrier between p and n regions is used to drive a current through external circuit when light is incident on junction is called
(a) LED (b) Photodiode
(c) Photovoltaic cell (d) None of these

39. A single silicon photovoltaic cell produces a voltage of
(a) 0.6 V (b) 1 V
(c) 60 V (d) 1000 V

40. In order to obtain greater power from photovoltaic cell, _____arrays of thousands of such cells are used.
(a) Series (b) Parallel
(c) Both of the above (d) None of these

41. The series-parallel arrays of photovoltaic cells is known as
(a) Photo-combination cell (b) Photoelectric cell
(c) Voltaic panel (d) Combination diode

42. Photovoltaic cells are commonly used in
(a) Logic circuits (b) Automatic switches

(c) Satellites (d) All of these

43. A transistor consists of a single crystal of germanium or silicon which is grown in such a way that it has _____ regions.
(a) 2 (b) 3
(c) 5 (d) 7

44. If the central region of a transistor is p-type, it is known as
(a) p-transistor (b) n-transistor
(c) n-p-n transistor (d) p-n-p transistor

45. When the n-type central region is sandwiched between two p-type regions, it forms
(a) p-transistor (b) n-transistor
(c) n-p-n transistor (d) p-n-p transistor

46. The central region of a transistor is known as
(a) Base (b) Emitter
(c) Collector (d) None of these

47. The base of a transistor is of the order of
(a) 1m (b) $1 \times 10{-}3$ m
(c) $1 \times 10{-}6$ m (d) $1 \times 10{-}9$ m

48. Which of the following part of the transistor is usually larger than the others?
(a) Base (b) Collector
(c) Emitter (d) None of these

49. Which of the following part of the transistor does have the greater concentration of impurity?
(a) Base (b) Collector
(c) Emitter (d) None of these

50. A transistor is a combination of _____ p-n junctions.
(a) 2 (b) 3
(c) 4 (d) 5

51. For normal operation of a transistor, the emitter-base junction is
(a) Forward biased (b) Reverse biased
(c) Not biased (d) Neutral

52. The most generally used transistor is
(a) p-n-p (b) n-p-n
(c) n-p (d) All of these

53. For a given transistor the ratio of collector current to base current is called
(a) Transistor ratio (b) Efficiency of transistor
(c) Gain of transistor (d) Loss of transistor

54. In a certain circuit, the transistor has a collector current of 20 mA and a base current of 20 μA. The current gain of the transistor is
(a) 250 (b) 1
(c) .001 (d) 1000

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55. The unit of current gain of transistor is
(a) Ampere (b) Volt
(c) Ohm (d) None

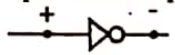
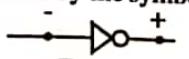
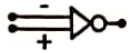
56. In majority of electronic circuits, transistors are used as
(a) Rectifiers (b) Amplifiers
(c) Modulators (d) Resistors

57. The ratio of output voltage to input voltage in a transistor is called
(a) Voltage constant of transistor (b) Amplification ratio
(c) Voltage loss of the amplifier (d) Voltage gain of the amplifier

58. For a typical arrangement, $R_c = 10\ k\Omega$, $r_{ie} = 1k\Omega$ and $\beta = 50$. The output voltage is _____times greater than the input voltage.
(a) 5 (b) 50
(c) 500 (d) 5000

59. To turn the switch off the _____is set zero while using transistor as a switch.
(a) Base current (b) Emitter current
(c) Collector current (d) All of these

60. To turn the switch on the _____is set zero.
(a) Base current (b) Emitter current
(c) Collector current (d) All of these

61. The operational amplifier is represented by the symbol
(a)  (b) 
(c)  (d)

62. A signal that is applied at the inverting input, appears at the output terminal with a phase change of
(a) 0° (b) 45°
(c) 90° (d) 180°

63. A signal that is applied at the non-inverting terminal appears at the output terminal with a phase change of
(a) 0° (b) 45°
(c) 90° (d) 180°

64. The ratio of the output voltage to the voltage difference between non-inverting and inverting inputs when there is no external connection between the output and the inputs is called
(a) Voltage gain of amplifier (b) Closed loop gain
(c) Open loop gain (d) Loop gain

65. The current flows through the two terminals of the inputs in op-amp is
(a) 0 (b) 0.3 Ma
(c) 0.7 mA (d) 1 mA

66. The open loop gain of the amplier is usually of the order of
(a) 10 (b) 103
(c) 105 (d) 108

67. When op-amp is used as an inverting amplifier, the potential of _____is zero.
(a) Inverting terminal (b) Non-inverting terminal
(c) Output terminal (d) None of these

68. With usual notations, the gain of the inverting amplifier is defined as
(a) $G = -\frac{R_2}{R_1}$ (b) $G = \frac{V_o}{V_i}$
(c) $G = \frac{I_o}{I_i}$ (d) $G = \beta\frac{I_o}{I_i}$

69. If $R_1 = 10k\Omega$ and $R_2 = 1000\ k\Omega$, the gain of amplifier (inverting amplifier) is
(a) 10,000 (b) -10,000
(c) -0.01 (d) -100

70. When op-amp is used as non-inverting amplifier, which of the following is true?
(a) $V_- > V_+$ (b) $V_+ > V_-$
(c) $V_+ \approx V_-$ (d) $V_+ = O$

71. For non-inverting amplifier if R_1=infinity and R_2=0 then the gain is
(a) α (b) 0
(c) 1 (d) -1

72. With usual notations the gain of non-inverting amplifier is defined as
(a) Gain $= 1+\frac{R_1}{R_2}$ (b) Gain $= 1+\frac{R_2}{R_1}$
(c) Gain $= \frac{R_1}{R_2}-1$ (d) Gain $= -R_1R_2$

73. Op-amp usually requires two power supplies of_____voltage and _____polarity.
(a) Unequal, same (b) Unequal, different
(c) Equal, same (d) Equal, different

74. Most op-amp operate with input voltage of
(a) 0 V (b) $\pm$1.5 V
(c) $\pm$3 V (d) $\pm$12 V

75. Which of the following is used in op-amp when the comparator is used as a night switch?
(a) LED (b) LDR
(c) PVR (d) NVR

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76. The street lights are turned on when the output of op-amp switches to
(a) 0 (b) 1V
(c) -Vcc (d) +Vcc

77. A digital system deal with quantities or variables which have _____ discrete values or states.
(a) 2 (b) 3
(c) 4 (d) 5

78. Which of the following designations are used to represent the two quantized states of digital systems?
(a) 1,0 (b) On, off
(c) Closed, open (d) All of these

79. Which of the following is used for the manipulation of the quantities which have the value 1 and 0?
(a) Calculus (b) Mechanics
(c) Boolean algebra (d) Analytical algebra

80. Boolean algebra is based on _____basic operations.
(a) 2 (b) 3
(c) 4 (d) 5

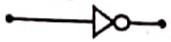
81. Which of the following operation is not used in Boolean algebra?
(a) "AND" (b) "EQUAL"
(c) "OR" (d) "NOT"

82. The electronic circuits which implement the various logic operations are known as
(a) Boolean circuits (b) Digital circuits
(c) Logic gates (d) Boolean gates

83. If a voltage of 0.5V is applied, the logic gate will recognize it as
(a) 0 (b) 1
(c) 0.5 (d) 2

84. If a voltage of 2.5V is applied, the logic gate will recognize it as
(a) 0 (b) 1
(c) 0.5 (d) 2

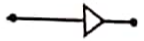
85. The mathematical notation for OR operation is
(a) $X = A+B$ (b) $X = \overline{A+B}$
(c) $X = A.B$ (d) $X = \overline{A-B}$

86. OR gate is symbolically represented by
(a) (b)
(c)  (d)

87. The output of OR gate will be zero when
(a) One input is 0 (b) One input is 1
(c) Both inputs are 0 (d) Both inputs are 1

88. The output of AND gate will be 1 when
(a) One input is 0 (b) One input is 1
(c) Both inputs are 0 (d) Both inputs are 1

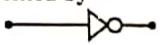
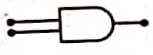
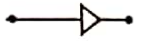
89. The output of AND gate will be O when
(a) Either of the input is 0 (b) One of the input is 1
(c) Both of the inputs are 0 (d) All of these

90. AND gate is symbolically represented by
(a) (b)
(c) (d) 

91. The mathematical notation for AND operation is
(a) $X = A+B$ (b) $X = A.B$
(c) $X = \overline{A.B}$ (d) $X = \overline{A+B}$

92. NOT gate is also known as
(a) Terminator (b) Inverter
(c) Converter (d) None of these

93. The mathematical notation of NOT gate is
(a) $X = \overline{A}$ (b) $X = \overline{A.B}$
(c) $X = \overline{A+B}$ (d) $X = \overline{A-B}$

94. Symbolically the NOT gate is represented by
(a) (b) 
(c)  (d) 

95. The output of NOT gate will be 1 when the input is
(a) 0 (b) 1
(c) 3 (d) 5

96. The output of OR gate is inverted in
(a) NOT gate (b) NAND gate
(c) AND gate (d) NOR gate

97. The mathematical notation for NOR gate is
(a) $X = \overline{A+B}$ (b) $X = \overline{A}$
(c) $X = A.B$ (d) $X = \overline{A.B}$

98. The output of AND gate is inverted in
(a) OR gate (b) NOR gate
(c) NAND gate (d) NOT gate

99. The mathematical notation for NAND operation is
(a) $X = \overline{A}$ (b) $X = \overline{A+B}$
(c) $X = \overline{A-B}$ (d) $X = \overline{A.B}$

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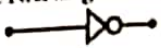
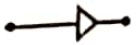
100. The NAND gate is symbolically represented by

(a) 
(b)
(c) 
(d)

ANSWERS

1.	b	2.	c	3.	d	4.	d	5.	b
6.	d	7.	c	8.	a	9.	a	10.	c
11.	b	12.	a	13.	d	14.	c	15.	d
16.	d	17.	d	18.	a	19.	c	20.	b
21.	c	22.	b	23.	c	24.	c	25.	a
26.	c	27.	a	28.	b	29.	d	30.	b
31.	c	32.	a	33.	c	34.	d	35.	b
36.	d	37.	d	38.	c	39.	a	40.	c
41.	c	42.	c	43.	b	44.	c	45.	d
46.	a	47.	c	48.	b	49.	c	50.	a
51.	a	52.	b	53.	c	54.	d	55.	d
56.	b	57.	d	58.	c	59.	a	60.	c
61.	c	62.	d	63.	a	64.	c	65.	a
66.	c	67.	b	68.	a	69.	d	70.	c
71.	c	72.	b	73.	d	74.	d	75.	b
76.	d	77.	a	78.	d	79.	c	80.	b
81.	b	82.	c	83.	a	84.	b	85.	a
86.	a	87.	c	88.	d	89.	d	90.	c
91.	b	92.	b	93.	a	94.	b	95.	a
96.	d	97.	a	98.	c	99.	d	100.	d

ELECTROMAGNETISM

1. What is set up in the region surrounding a current carrying wire?
(a) Electric field (b) Magnetic field
(c) Gravitational field (d) Kinetic field

2. The lines of force are circular and their direction depends upon the direction of
(a) Current (b) Voltage
(c) Change (d) Capacitance

3. The _____ field lasts only as long as the current is flowing through the wire.
(a) Electric (b) Magnetic
(c) Gravitational (d) Kinetic

4. According to right hand rule, if the wire is grasped in fist of right hand with the thumb pointing in the direction of the current, the fingers of the hand will circle the wire in the direction of the
(a) Electric field (b) Magnetic field
(c) Gravitational field (d) Kinetic field

5. If a current carrying conductor is placed in an external magnetic field, the magnetic field of the conductor will interact with the external magnetic field, as a result of which the conductor may experience a
(a) Force (b) Torque
(c) Momentum (d) Acceleration

6. If α be the angle between the conductor and the magnetic field, the force is directly proportional to
(a) $\sin\alpha$ (b) $\cos\alpha$
(c) $\tan\alpha$ (d) $\operatorname{cosec}\alpha$

7. The force experienced by a current carrying conductor placed in magnetic field is directly proportional to
(a) Current (b) Square of current
(c) Cube of current (d) Square-root of current

8. The force experienced by a current carrying conductor placed in magnetic field is directly proportional to
(a) Current (b) Length of conductor
(c) Strength of magnetic field (d) All of them

9. Another name of strength of magnetic field is
(a) Magnetic induction (b) Magnetic stimulation
(c) Magnetic insertion (d) Magnetic annihilation

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10. The force acting on one metre length of the conductor placed at right angle to the magnetic field when one ampere current is passing through it is called
(a) Magnetic induction (b) Electric intensity
(c) Induced emf (d) Voltage

11. The SI unit of strength of magnetic field is
(a) Tesla (b) Henry
(c) Joule (d) Farad

12. A magnetic field is said to have a strength of one _____ if it exerts a force of one Newton on one metre length of the conductor placed at right angle to the field when a current of one ampere passes through the conductor.
(a) Tesla (b) Henry
(c) Joule (d) Farad

13. 1T =
(a) $1\ NA^{-1}\ m^{-1}$ (b) $1\ N\ m^{-1}\ s$
(c) $1\ Nm^{2}\ s^{-2}$ (d) $1\ NA^{-1}\ s^{-1}$

14. The current flowing towards the reader is symbolized by a
(a) Dot (b) Cross
(c) Star (d) Triangle

15. The current following away from the reader is symbolized by a
(a) Dot (b) Cross
(c) Star (d) Triangle

16. A 0.2 m wire carrying a current of 10 A is placed in a uniform magnetic field of 0.30 T. If the wire makes an angle of 180° with the direction of magnetic field, the magnitude of the force acting on the wire is
(a) 0 N (b) 0.45 N
(c) 7.5 N (d) 12 N

17. The dot product of magnetic field strength and area is equal to
(a) Electric flux (b) Magnetic flux
(c) Electromagnetic flux (d) None of them

18. The magnetic flux is maximum when magnetic field is directed along the normal to the area. The magnitude of this flux will be
(a) BA (b) BA^{-1}
(c) BA^{2} (d) BA^{-2}

19. When the magnetic field is parallel to the plane of the area, the magnetic flux is equal to
(a) Zero (b) BA
(c) BA^{2} (d) BA^{-2}

20. When 10 Wb m^{-2} Magnetic field makes an angle of 45° with 1 m^{2} area, the magnitude of magnetic flux is
(a) 35.2 Wb (b) 45.9 Wb
(c) 63.3 Wb (d) 70.7 Wb

21. The SI unit of magnetic flux is
(a) Newton (b) Joule
(c) Weber (d) Farad

22. 1 Wb =
(a) NmA (b) NmA^{-1}
(c) $Nm^{-1}A$ (d) $Nm^{2}A^{-1}$

23. Flux per unit area of a surface perpendicular to magnetic induction is known as
(a) Flux density (b) Specific flux
(c) Critical flux (d) All of them

24. Magnetic field strength is also known as
(a) Magnetic induction (b) Flux density
(c) Both of them (d) None of them

25. Magnetic field strength is measured in terms of
(a) Wb m^{-2} (b) $NA^{-1}m^{-1}$
(c) T (d) All of them

26. A closed path in the form of a circle enclosing the current carrying wire is referred as
(a) Amperean path (b) Straight path
(c) Coulombian path (d) Gaussian path

27. Ampere circuital law states the sum of the quantities B. ΔL for all path elements into which the complete loop has been divided equals _____ times the total current enclosed by the loop.
(a) k (b) εo
(c) μo (d) C

28. The value of permeability of free space in SI units is _____ Wb $A^{-1}m^{-1}$.
(a) $\pi \times 10^{-7}$ (b) $2\pi \times 10^{-7}$
(c) $3\pi \times 10^{-7}$ (d) $4\pi \times 10^{-7}$

29. A long tightly wound, cylindrical coil of wire is called
(a) Solenoid (b) Loop
(c) Cone (d) None of them

30. According to _____ rule, "hold the solenoid in the right hand with fingers curling in the direction of the current, the thumb will point in the direction of the field".
(a) Ampere (b) Coulomb
(c) Right hand (d) Left hand

31. A 0.15 m long solenoid carries 5 A current. If 0.013 Wb m^{-2} magnetic field is present inside the solenoid, how many turns the solenoid has?
(a) 100 (b) 200
(c) 300 (d) 400

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32. The force on a moving charge in a magnetic field depends on
(a) Charge (b) Velocity
(c) Magnetic field strength (d) All of them

33. For a moving charge in magnetic field, the magnetic force is perpendicular to
(a) Magnetic field (b) Velocity
(c) Both of them (d) None of them

34. 10–6 C charge is moving with a velocity of 2 × 105 m/s in a magnetic field of strength 0.1 T. The angle between the velocity and magnetic field is 0o. The magnitude of the force is
(a) 0 N (b) 2 N
(c) 4 N (d) 8 N

35. When a charge particle is moving with a certain velocity in a region where there is an electric field and magnetic field, the total force is the vector sum of the electric force and magnetic force. This force is known as
(a) Coulomb force (b) Gravitational force
(c) Lorentz force (d) Amperean force

36. When a charged particle is in an electric and magnetic field, the electric force does work whereas magnetic force acts as
(a) Reflecting force (b) Repulsive force
(c) Deflecting force (d) All of them

37. An electron is moving at a rate of 2×10^7 ms^{-1} in a uniform magnetic field. If the radius of the orbit is 0.0943 m, the magnitude of the magnetic field is
(a) 0.0012 T (b) 0.0024 T
(c) 0.0036 T (d) 0.0048 T

38. A helium nucleus enters into a velocity selector where the electric intensity is 300 Vm^{-1} and the magnetic induction is 0.2 T. What must be the speed of this helium nucleus so that it will move undeviated through the field?
(a) 1000 ms^{-1} (b) 1500 ms^{-1}
(c) 2000 ms^{-1} (d) 2500 ms^{-1}

39. CRO stands for
(a) Cathode ray oscilloscope (b) Cathode rod oscillator
(c) Cathode ray oscillator (d) Cathode rod oscilloscope

40. CRO is a high speed _____ device.
(a) Current measuring (b) Temperature sensing
(c) Graph plotting (d) Particles counting

41. Cathode ray oscilloscope is called so because it traces the desired waveform with a beam of
(a) Alpha particles (b) Electrons
(c) Protons (d) Neutrons

42. How many anodes are usually present in an electron gun?
(a) 1 (b) 2
(c) 3 (d) 4

43. A CRO works by deflecting a beam of electrons as they pass through uniform electric field between the _____ sets of parallel plates.
(a) 1 (b) 2
(c) 3 (d) 4

44. CRO is used for displaying the waveform of a given voltage. Once the waveform is displayed, we can measure
(a) Voltage (b) Frequency
(c) Phase (d) All of them

45. A coil of 0.4 m2 area carries 5 A current and is placed in 12 T magnetic field. The angle between the field and the plane of the coil is 90o. The torque produced is
(a) 0 Nm (b) 3 Nm
(c) 4.8 Nm (d) 2.4 Nm

46. _____ is an electrical instrument used to detect the passage of current.
(a) Galvanometer (b) CRO
(c) Voltmeter (d) AVO meter

47. In case of galvanometer, when a current is passed through the coil, it is acted upon by a couple which tends to rotate the coil. This couple is known as
(a) Reflecting couple (b) Deflecting couple
(c) Restoring couple (d) Resisting couple

48. In case of galvanometer, the torsional couple tends to untwist the suspension and restore the coil to its original position. This couple is known as
(a) Reflecting couple (b) Deflecting couple
(c) Restoring couple (d) Resisting couple

49. In case of galvanometer, the restoring couple of the suspension wire is proportional to the angle of deflection as long as the suspension wire obeys
(a) Coulomb's law (b) Ampere's law
(c) Hooke's law (d) Faraday's law

50. Couple for unit twist is known as
(a) Frictional couple (b) Torsional couple
(c) Elastical couple (d) Deflecting couple

51. In a moving coil galvanometer, the current passing through the coil is directly proportional to
(a) Angle of deflection (b) Angle of repose
(c) Critical angle (d) Substantial angle

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52. **The galvanometer, you have used in your physics lab, is**
(a) Digital galvanometer
(b) Pivot type galvanometer
(c) Reciprocating galvanometer
(d) None of them

53. **Galvanometer can be made more sensitive by decreasing**
(a) Torsional constant (b) Magnetic field
(c) Area (d) Number of turns of coil

54. **Galvanometer can be made more sensitive by increasing**
(a) Magnetic field (b) Area
(c) Number of turns of coil (d) All of them

55. **Couple 'C' for unit twist of the suspension wire of a moving coil galvanometer can be decreased by**
(a) Increasing the length of wire
(b) Decreasing the diameter of wire
(c) Both of them
(d) None of them

56. **The resistance measuring part of the AVO meter is actually a multirange**
(a) Ammeter (b) Voltmeter
(c) Ohmmeter (d) Galvanometer

57. **DMM stands for**
(a) Digital multimeter (b) Discrete multimeter
(c) Discrete multiplier meter (d) Digital multiplier meter

58. **DMM is used to measure**
(a) Resistance (b) Current
(c) Voltage (d) All of them

59. **Digital multimeter is an electronic instrument which is a digital version of**
(a) Ammeter (b) Voltmeter
(c) Ohmmeter (d) AVO meter

60. **A solenoid is 0.5 m long with 10000 turns of copper wire. 16 A of current is passing through it. The magnitude of magnetic field is**
(a) 0.2 T (b) 0.4 T
(c) 0.6 T (d) 0.8 T

ANSWERS

1.	b	2.	a	3.	b	4.	b	5.	a
6.	a	7.	a	8.	d	9.	a	10.	a
11.	a	12.	a	13.	a	14.	a	15.	b
16.	a	17.	b	18.	a	19.	b	20.	d
21.	c	22.	b	23.	a	24.	c	25.	d
26.	a	27.	c	28.	d	29.	a	30.	c

31.	c	32.	d	33.	c	34.	a	35.	c
36.	c	37.	a	38.	b	39.	a	40.	c
41.	b	42.	c	43.	b	44.	d	45.	a
46.	a	47.	b	48.	c	49.	c	50.	b
51.	a	52.	b	53.	a	54.	d	55.	c
56.	c	57.	a	58.	d	59.	d	60.	b

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ELECTROMAGNETIC INDUCTION

SET – I

1. Who discovered that electric currents produces magnetic field?
(a) Henry (b) Ampere
(c) Faraday (d) Oersted

2. The emf set up in a conductor when it moves across a magnetic field is called
(a) Induced emf (b) Effective emf
(c) Active emf (d) Optimum emf

3. The current generated when a conductor moves across a magnetic field is called
(a) Induced emf (b) Effective emf
(c) Active emf (d) Optimum emf

4. When a conductor moves across a magnetic field, an emf is set up in it. This phenomenon is known as
(a) Electrostatic induction (b) Magnetic induction
(c) Electromotive induction (d) Electromagnetic induction

5. When a conductor moves across the magnetic field, the induced current depends upon
(a) Speed of moving conductor (b) Resistance of the loop
(c) Both of them (d) None of them

6. Induced current × Resistance of loop =
(a) Voltage drop (b) Induced emf
(c) Magnetic field strength (d) Electric intensity

7. When a loop of wire is moved across a magnetic field, an induced current is generated. The magnitude of this current can be increased by increasing
(a) Magnetic field (b) Speed of loop
(c) Number of turns of loop (d) All of them

8. The relative motion of conductor and magnetic field produces
(a) Induced emf (b) Induced current
(c) Both of them (d) None of them

9. The induced emf in a conductor moving in a magnetic field is due to change in
(a) Electric flux (b) Electric intensity
(c) Magnetic flux (d) All of them

10. The emf induced by the motion of a conductor across a magnetic field is called
(a) Motional emf (b) Statical emf
(c) Vibrational emf (d) Electromagnetic emf

11. A metal rod of length 0.25 m is moving at a speed of 0.5 ms^{-1} in a direction parallel to a 0.25 T magnetic field. The emf produced in the rod is
(a) 0 V (b) 0.003 V
(c) 0.066 V (d) 0.627 V

12. What is the length of a metal rod which is moving at a speed of 0.5 ms^{-1} in a direction perpendicular to a 0.25 T magnetic field? The motional emf produced in the rod is 0.125 V
(a) 1 m (b) 2 m
(c) 3 m (d) 4 m

13. The average emf induced in a conducting coil of N loops is equal to the negative of the rate at which the magnetic flux through the coil is changing with _____. This is known as Faraday's law.
(a) Time (b) Distance
(c) Charge (d) Current

14. A loop of wire is placed in a uniform magnetic field that is perpendicular to the plane of the loop. The strength of the magnetic field is 0.6 T. The rate of change of magnetic flux is 1 Wb s^{-1}. The magnitude of emf induced in the loop is
(a) 0 V (b) 0.6 V
(c) 1 V (d) 2.7 V

15. According to Lenz's law, "the direction of the _____ is always so as to oppose the change which causes the current".
(a) Voltage (b) Induced current
(c) Magnetic flux (d) Polarity

16. Lenz's law refers to
(a) Induced current (b) Induced EMF
(c) Both of them (d) Polarity

17. Lenz's law is a statement of law of conservation of _____ that can be conveniently applied to the circuits involving induced currents.
(a) Mass (b) Energy
(c) Momention (d) Charge

18. By doubling the speed of conductor moving in a magnetic field, the induced emf is
(a) Doubled (b) Four times
(c) Halved (d) Unchanged

19. The phenomenon in which a changing current in one coil induces an emf in another coil is called
(a) Mutual induction (b) Self induction
(c) Primary induction (d) Secondary induction

20. Net flux passing through the secondary coil is directly proportional to
(a) Current in primary coil (b) Current in secondary coil

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(c) Both of them (d) None of them

21. **The ratio of net flux through the secondary coil to the current in primary coil is called**
(a) Mutual inductance (b) Self inductance
(c) Primary inductance (d) Secondary inductance

22. **10 Wb of magnetic flux is passing through a secondary coil having 10 turns. If 10 A of current is passing through the primary coil, the mutual inductance is equal to**
(a) $10\ WbA^{-1}$ (b) $20\ WbA^{-1}$
(c) $50\ WbA^{-1}$ (d) $100\ WbA^{-1}$

23. **The unit of mutual inductance is**
(a) NmA^{-1} (b) NmA^{-2}
(c) NmA^{-3} (d) NmA^{-4}

24. **The mutual inductance depends upon**
(a) Number of turns of the coils and their cross-sectional area
(b) Distance between the coils
(c) Nature of core material (d) All of them

25. **The emf induced in the secondary coil is proportional to the time rate of change of in the primary coil.**
(a) Charge (b) Current
(c) Electric intensity (d) Electric force

26. **The ratio of average emf induced in the secondary coil to the time rate of change of current in the primary coil is called**
(a) Mutual inductance (b) Self inductance
(c) Primary inductance (d) Secondary inductance

27. **The SI unit of mutual inductance is**
(a) VsA^{-1} (b) $Vs^{-1}\ A$
(c) $VS^{-1}\ A$ (d) $Vs^{-1}\ A^{-1}$

28. **1 H =**
(a) $VS\ A^{-1}$ (b) $Vs^{-1}\ A$
(c) $VS^{-1}\ A$ (d) $Vs^{-1}\ A^{-1}$

29. **The mutual inductance of the pair of coils in which a rate of change of current of one ampere per second in the primary causes an induced emf of one volt in the secondary is called one**
(a) Henry (b) Joule
(c) Coulomb (d) Tesla

30. **The current is changing as $10\ As^{-1}$ in primary coil where as the value of mutual inductance is 2 H. The induced emf in secondary coil is**
(a) 5 V (b) 10 V
(c) 20 V (d) 25 V

31. **If magnetic flux through the coil is changed by varying the current in it, an emf is induced. This emf is known as**
(a) Self induced emf (b) Mutual induced emf

(c) Optimum induced emf (d) Relative induced emf

32. **The phenomenon in which a changing current in a coil induces an emf in itself is called**
(a) Self induction (b) Mutual induction
(c) Relative induction (d) Effective Induction

33. **Self inductance is defined as the ratio of the magnetic flux through the coil to the**
(a) Current (b) Capacitance
(c) Voltage (d) Electric intensity

34. **Self inductance depends upon**
(a) Number of turns of coil (b) Area of cross-section
(c) Material of core (d) All of them

35. **Which of the following is a ferromagnetic material?**
(a) Glass (b) Plastic
(c) Wood (d) Iron

36. **Self induced emf in a coil is proportional to the time rate of change of _____ in the coil.**
(a) Current (b) Voltage
(c) Electric field strength (d) Energy

37. **The ratio of the average emf to the rate of change of current in the coil is called**
(a) Self inductance (b) Mutual inductance
(c) Average inductance (d) Mean inductance

38. **The SI unit of self inductance is**
(a) Joule (b) Farad
(c) Henry (d) Newton

39. **Self induced emf is also called as**
(a) Back emf (b) Front emf
(c) Forward emf (d) Reverse emf

40. **In alternating current, inductors behave like**
(a) Resistors (b) Capacitors
(c) Insulators (d) Semi-conductors

41. **If current is changing at $2.5\ As^{-1}$ in a coil having self inductance of 4 H, the self induced emf is**
(a) 1.25 V (b) 2.5 V
(c) 5 V (d) 10 V

42. **Energy can be stored in**
(a) Electric field between the plates of a capacitor
(b) Magnetic field of an inductor
(c) Both of them (d) None of them

43. **If current through the inductor is doubled, the potential energy stored in it is**
(a) Doubled (b) Four times

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(c) Halved (d) Unchanged

44. If the self inductance of an inductor is 4H and 2A current is flowing through it, the potential energy stored is
(a) 2 J (b) 4 J
(c) 6 J (d) 8 J

45. If magnetic field strength is doubled, the potential energy stored is
(a) Doubled (b) Four times
(c) Halved (d) Unchanged

46. If length of the wire of inductor is doubled, the potential energy stored in it is
(a) Doubled (b) Four times
(c) Halved (d) Unchanged

47. A device which converts mechanical energy into electrical energy is called
(a) Electric motor (b) Current generator
(c) Transformer (d) Amplifier

48. The principle of an electric generator is based on
(a) Boyle's law (b) Newton's law of gravitation
(c) Lenz's law
(d) Faraday's law of electromagnetic induction

49. If the magnetic field strength is doubled, the emf produced in the electric generator is
(a) Doubled (b) Four times
(c) Halved (d) Unchanged

50. The curve of the emf produced by the electric generator versus time is
(a) Straight line (b) Sine wave
(c) Parabolic (d) Exponential

51. The curve of the current produced by the electric generator versus time is
(a) Straight line (b) Sine wave
(c) Parabolic (d) Exponential

52. A current that reverses in direction 'f' times per second is called
(a) Direct current (b) Alternating current
(c) Forward current (d) Leakage current

53. In an electric generator, a number of coils are wound around an iron cylinder which is rotated in the magnetic field. This assembly is called as
(a) Split rings (b) Armature
(c) Core (d) Body

54. Mangla Dam produces electricity from electric generators whose armatures are rotated by
(a) Fuel engines (b) Turbines run by waterfall

(c) Steam energy (d) Stem turbines

55. An alternating current generator is operating at 50 Hz. The coil of the generator has an area of 0.012 m^2. Magnetic field of 0.32 T is present in which coil rotates in order to produce an emf of maximum value of 240 V. The number of turns of the coil is
(a) 10 (b) 50
(c) 100 (d) 200

56. The device that prevents the direction of current from changing is called
(a) Commutator (b) Connector
(c) Collector (d) Communicator

57. D.C. generator is different from A.C. generator in that the slip rings are replaced by
(a) Split rings (b) Stand rings
(c) Connecting rings (d) Carbon rings

58. The split rings of a D.C. generator act as
(a) Commutator (b) Connector
(c) Collector (d) Communicator

59. The devices in the circuit that consume electrical energy are known as
(a) Load (b) Source
(c) Consumer (d) User

60. The rotational motion of electrical generators is opposed by the production of counter torque. This effect is known as
(a) Back motion effect (b) Forward motion effect
(c) Front motor effect (d) Back motor effect

61. A device which converts electrical energy into mechanical energy is called
(a) Electrical generator (b) D.C. motor
(c) Sensor (d) Transducer

62. The current is an input of
(a) A.C. generator (b) D.C. generator
(c) D.C. motor (d) All of them

63. The windings of the electromagnet in a D.C. motor are called
(a) Field coils (b) Ground coils
(c) Support coils (d) Head coils

64. The field coils in a D.C. motor can be attached to the armature coils in
(a) Series (b) Parallel
(c) Both of them (d) None the them

65. A motor is just like a _____ running in reverse.
(a) Generator (b) Heater
(c) Refrigerator (d) Capacitor

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66. When the coil of the motor rotates across the magnetic field by the applied potential difference, an emf is induced in it. This emf is called
(a) Back emf (b) Front emf
(c) Forward emf (d) Turn emf

67. The magnitude of the back emf increases with the _____ of motor.
(a) Speed (b) Weight
(c) Volume (d) Material

68. A motor is switched on and is run for 70 minutes with constant speed. At what time, the back emf is zero?
(a) 0 min (b) 15 min
(c) 25 min (d) 50 min

69. An electrical device which changes a given alternating emf into a larger or smaller alternating emf is called
(a) A.C. generator (b) D.C. generator
(c) D.C. motor (d) Transformer

70. A transformer works on the principle of _____between two coils.
(a) Self induction (b) Mutual induction
(c) Primary induction (d) Secondary induction

71. The coils of the transformer are made of
(a) Copper (b) Iron
(c) Tungsten (d) Aluminium

72. The case of the transformer is made of
(a) Copper (b) Iron
(c) Tungsten (d) Aluminum

73. The coil of the transformer to which A.C. power is supplied is called _____ coil.
(a) Primary (b) Secondary
(c) Tertiary (d) Poly

74. The coil of transformer from which power is delivered to the circuit is called
(a) Primary (b) Secondary
(c) Tertiary (d) Poly

75. The two coils of transformer are linked
(a) Electrically (b) Magnetically
(c) Both of them (d) None of them

ANSWERS

1.	d	2.	a	3.	a	4.	d	5.	c
6.	b	7.	d	8.	c	9.	c	10.	a
11.	a	12.	a	13.	a	14.	c	15.	b
16.	a	17.	b	18.	a	19.	a	20.	c
21.	a	22.	a	23.	b	24.	d	25.	b
26.	a	27.	a	28.	a	29.	a	30.	c
31.	a	32.	a	33.	a	34.	d	35.	d
36.	d	37.	a	38.	c	39.	a	40.	a
41.	a	42.	c	43.	b	44.	d	45.	b
46.	b	47.	b	48.	d	49.	a	50.	b
51.	a	52.	b	53.	b	54.	b	55.	d
56.	b	57.	a	58.	a	59.	a	60.	d
61.	a	62.	c	63.	a	64.	c	65.	a
66.	a	67.	a	68.	a	69.	d	70.	b
71.	a	72.	b	73.	a	74.	b	75.	b

SET – II

1. _____ were the first to utilise magnets for a range.
(a) European (b) Indians
(c) Chinese (d) None of these

2. William Gilbert was the scientist who first made artificial magnets by rubbing pieces of _____against magnetic rocks.
(a) Iron (b) Steel
(c) Copper (d) None of these

3. Scientist John Mitchell was accredited with finding out magnetic forces that follow_____.
(a) The inverse proportion law (b) The definite proportion law
(c) The inverse square law (d) Centripetal law

4. Scientist Hans Christian Oersted revealed that an electric current influences a_____.
(a) Magnetic compass (b) Magnetic lines of forces
(c) Magnetic field (d) None of these

5. A generator exchanges _____into electrical energy.
(a) Mechanical energy (b) Heat energy
(c) Warmth energy (d) None of these

6. By Lenz's law, the induced emf always resists _____that produced it.
(a) The change in acceleration (b) The change in time
(c) The change in flux (d) None of these

7. Magnetism related to _____.
(a) Law of gases (b) Charge property
(c) Electricity (d) None of these

8. A magnet moves into a coil of wire having a current. If the magnet dragged back out of the coil in the opposite direction as it went into the coil, then there will be a current fashioned in the coil in _____as before.
(a) The same direction (b) The opposite direction

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(c) The parallel direction (d) None of these

9. **The source of all magnetism affects _____.**
(a) Electric charge (b) Negative charge
(c) Positive charge (d) None of these

10. **Unlike magnetic poles_____ each other.**
(a) Attract (b) Keep away from
(c) Ward off (d) None of these

11. **Numerous paper clips hanged from the north pole of a magnet. The persuaded pole in the base of lowest paper clip is a _____.**
(a) North pole (b) South pole
(c) East pole (d) West pole

12. **Moving electric charges will interact with an electric field and a _____.**
(a) Magnetic field (b) Repugnant field
(c) Repulsive field (d) None of these

13. **_____is due to the motion of electrons as they move around the nucleus and spin on their axes.**
(a) Magnetism (b) Electro magnetic force
(c) Induced emf (d) None of these

14. **_____normally occur in iron.**
(a) Magnetic ranges (b) Magnetic domains
(c) Magnetic poles (d) None of these

15. **A moving electron produces a_____.**
(a) Centripetal force (b) Magnetic field
(c) Centrifugal force (d) None of these

16. **The intensity of cosmic rays attacking the earth's surface is _____.**
(a) Largest at the poles (b) Lowest at the poles
(c) Normal at the poles (d) None of these

17. **The magnetic north pole of the earth is nearest to _____.**
(a) Canada (b) Australia
(c) America (d) None of these

18. **_____ of a compass needle points to a south pole of a magnet.**
(a) North pole (b) South pole
(c) East pole (d) West pole

19. **An iron rod turns out to be magnetic when the net spins of its electrons are in the_____.**
(a) Lower direction (b) Upper direction
(c) Same direction (d) None of these

20. **An electric motor and electric generator are especially _____ devices.**
(a) Analogous (b) Different

(c) Opposite (d) None of these

21. **Evaluated to the gigantic force that attracts an iron tack to a burly magnet, the force that the tack exerts on the magnet is _____.**
(a) Moderately small (b) Equally huge
(c) Rather small (d) None of these

22. **The force on an electron affecting in a magnetic field will be the biggest when its direction is_____ to the magnetic field direction.**
(a) Equivalent (b) Parallel
(c) Perpendicular (d) None of these

23. **Electric field can increase a moving_____.**
(a) Electron's speed (b) Proton's speed
(c) Neutron's speed (d) None of these

24. **_____ can accelerate an electron, but not at all modify its speed.**
(a) Electric field (b) Magnetic field
(c) Proton's speed (d) None of these

25. **A likely reason for the survival of the earth's magnetic field is moving charges in the liquid part of the earth's core, huge numbers of very slow moving charges in the earth and _____.**
(a) Convection currents in the liquid part of the earth's core
(b) Because of earth's attitude
(c) Gravitational force
(d) None of these

26. **A bar magnet is broken in two pieces then each piece is _____ as the original magnet.**
(a) Full strong (b) Double strong
(c) Half as strong (d) None of these

27. **When there is a change in the magnetic field in a closed loop of wire then _____ and electromagnetic induction occurs.**
(a) A voltage is induced in the wire
(b) A voltage is broken in the wire
(c) Electric current is produced
(d) None of these

28. **A device that transforms electrical energy to mechanical energy is called a(an) _____.**
(a) Originator (b) Motor
(c) Machine (d) None of these

29. **A transformer really transforms_____.**
(a) Voltage (b) Current
(c) Induced emf (d) None of these

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30. **Hasty changes of a magnetic field induce_____.**
(a) A positive charge (b) A negative charge
(c) An electric field (d) None of these

31. **_____ occurs in a coil when there is a transformation in magnetic field intensity in the coil.**
(a) Electromagnetic induction (b) Magnetic flux
(c) Electrical energy (d) None of these

32. **The main_____ between electric charges and magnetic poles are that electric charges can be isolated whereas magnetic poles cannot be isolated**
(a) Dissimilarity (b) Similarity
(c) Relation (d) None of these

33. **Voltage can be induced in a wire by moving the wire near a magnet, by moving a magnet near the wire and _____ in a nearby wire.**
(a) Struck the current (b) Changing the current
(c) Stop the current (d) None of these

34. **A certain transformer doubles input voltage. If the primary coil has 10 A of current, then _____is 5 A.**
(a) The voltage in the secondary coil
(b) The current in the secondary coil
(c) The voltage in the primary coil
(d) None of these

35. **As a motor armature turns faster and faster, _____in the motor windings decreases.**
(a) Net current (b) Positive current
(c) Negative current (d) None of these

36. **The first stones that were originated to have magnetic characters were called_____.**
(a) Lodestones (b) Copper ore
(c) Nickel ore (d) Limestone

37. **If the primary transformers were associated to a DC power resource, the transformer would have a voltage output merely while being _____.**
(a) Associated with high voltage
(b) Related or disengaged
(c) Connected or linked
(d) None of these

38. **The expression magnetism comes from_____, a province of Greece.**
(a) A region of Malaysia (b) A region of England
(c) A region of Magnesia (d) None of these

39. **Metal detectors, like the ones used at airports, are made active by_____.**
(a) Electromagnetic induction (b) Conductors
(c) Super conductors (d) Semi conductors

40. **You would have eight complete magnets if you broke a bar magnet into_____.**
(a) Four pieces (b) Six pieces
(c) Eight pieces (d) Sixteen pieces

41. **Most materials are not magnetic since the magnetic field produced by the _____is cancelled.**
(a) Electron conductivity (b) Electron charge
(c) Electron spin (d) None of these

42. **If we had a billion iron atoms clustered together, we could not see them without_____.**
(a) Lens (b) Magnification
(c) Electricity (d) None of these

43. **A moving neutron does not produce a_____.**
(a) Centrifugal force (b) Magnetic field
(c) Power (d) None of these

ANSWERS

1.	c	2.	a	3.	c	4.	a	5.	a
6.	c	7.	c	8.	b	9.	a	10.	a
11.	a	12.	a	13.	a	14.	b	15.	b
16.	a	17.	b	18.	a	19.	c	20.	a
21.	b	22.	c	23.	a	24.	b	25.	a
26.	c	27.	a	28.	b	29.	a	30.	c
31.	a		a	33.	b	34.	b	35.	a
36.	a	37.	b	38.	c	39.	a	40.	c
41.	c	42.	b	43.	b				

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SPECIAL RELATIVITY & NEWTON'S RINGS

1. **What two features of his life did Albert mainly be obliged for?**
   (a) Music and Math (b) Nature and Music
   (c) Physics and Chemistry (d) Politics and Physics

2. **The speed of light is same in all frames is not a consequence of the _____.**
   (a) Relativity principle (b) Physical principle
   (c) Newton's principle (d) None of these

3. **"If two events happen simultaneously in one frame, they occur _____." Complete the statement.**
   (a) At the same time in same frame
   (b) Concurrently in some other frame
   (c) Separately in some other frame
   (d) None of these

4. **The ether was supposed to be incorporeal and_____.**
   (a) Noticeable (b) Undetectable
   (c) Measurable (d) Obvious

5. **For the equation to concern, the two measures under consideration must happen at the same time in B's frame.**
   (a) $\Delta t\, B = \Delta t\, B$ (b) $\Delta t\, A = \gamma \Delta t\, B$
   (c) $\Delta t\, B = \gamma \Delta t\, C$ (d) None of these

6. **The experiments of _____showed that light travelled at the same speed in spite of the direction of motion through the ether, hence proving that there was no ether.**
   (a) Newton and Morley (b) Michelson and Morley
   (c) Newton and Faraday (d) None of these

7. **The energy of an electron moving with speed 2.45×10^8 m/s is _____.**
   (a) 0.68 MeV (b) 0.78 MeV
   (c) 0.88 MeV (d) 0.98 MeV

8. **How long would a roundtrip to a star 20 light years away come into sight to take to the passengers on board the spaceship?**
   (a) 40 years (b) 60 years
   (c) 80 years (d) 100 years

9. **If one of a set of clones is left on earth and the other travels to a faraway star at high speed and then returns to earth then whose age will be smaller?**
   (a) The stationary clones (b) The travelling clones
   (c) The motionless clones (d) None of these

10. **The relativistic Doppler effect is caused by _____of light waves due to motion of the source or observer.**
    (a) Compression and expansion
    (b) Solidity and expansion
    (c) Solidity and slimming down
    (d) Solidity and expansion

11. **If the speed of light were unlimited, the equivalent of the Lorentz transformations between frames would be like the.**
    (a) Galilean transformations
    (b) Newton's transformation
    (c) Gib's transformation
    (d) None of these

12. **Where are the rings formed in Newton's ring experiment?**
    (a) They are formed at the point of contact of lens and glass plate
    (b) They are formed at the point of contact of convex lens and glass plate
    (c) They are formed at the point of contact of concave lens and glass plate
    (d) None of these

13. **In Newton's ring experiment, rings are formed due to the interference between the light waves reflected from the top and bottom surfaces of the air film formed between_____.**
    (a) The lens and glass sheet
    (b) The concave lens and glass sheet
    (c) The convex lens and glass sheet
    (d) None of these

14. **The central area in Newton's Ring will be bright if we use _____ in place of plano convex lens.**
    (a) Plano concave lens (b) Double convex lens
    (c) Double concave lens (d) None of these

15. **Newton's rings are created by the _____between the light waves.**
    (a) Destructive and constructive interference
    (b) Destructive and simple interference
    (c) Only destructive interference
    (d) Only constructive interference

ANSWERS

1.	b	2.	a	3.	b	4.	b	5.	b
6.	b	7.	c	8.	a	9.	b	10.	a
11.	a	12.	a	13.	a	14.	a	15.	a

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ATOMIC SPECTRA

1. **The branch of physics that deals with the investigation of wavelengths and intensities of electromagnetic radiation emitted or absorbed by atoms is called as**
   (a) Nuclear physics (b) Atomic physics
   (c) Spectroscopy (d) Micro physics

2. **There are generally three types of spectra (i) Continuous Spectra (ii) Band Spectra; and (iii)**
   (a) Discontinuous spectra (b) Discrete or line spectra
   (c) Bandless spectra (d) None of these

3. **Black body radiation spectrum is an example of**
   (a) Continuous spectra (b) Band spectra
   (c) Discrete or line spectra (d) None of these

4. **Molecular spectra are the examples of**
   (a) Continuous spectra (b) Band spectra
   (c) Line spectra (d) Discontinuous spectra

5. **Atomic spectra are examples of**
   (a) Discrete or line spectra (b) Band spectra
   (c) Continuous spectra (d) Intra-continuous spectra

6. **Actual spectrometer uses _____ for better results.**
   (a) Convex lens (b) Diffraction grating
   (c) Concave lens (d) Convexo concave lens

7. **The fact that the spectrum of any element contains wavelengths that exhibit definite regularities was utilized in the _____ in identifying different elements.**
   (a) In the 20th century
   (b) In the second half of the 19th century
   (c) In the 18th century
   (d) In the late 20th century

8. **The spectrum of any element contains wavelength that exhibit definite regularities and these regularities were classified into certain groups called the**
   (a) Spectral lines (b) Spectral series
   (c) Spectral scope (d) Spectral grouping

9. **The first spectral series was identified by**
   (a) J.J. Balmer (b) Newton
   (c) Balmer's friends (d) Einstein

10. **The first spectral series was identified by J.J. Balmer in the spectrum of**
    (a) Nitrogen (b) Hydrogen
    (c) Helium (d) Boron

11. **$\text{In}\frac{1}{\lambda} = R_H\left[\frac{1}{2^2} - \frac{1}{n^2}\right]$, R_H is the Rydberg's constant and its value is**
    (a) $1.0974 \times 10^8\ m^{-1}$ (b) $1.0974 \times \times 10^7\ m^{-1}$
    (c) $1.0974 \times 10^6\ m^{-1}$ (d) $1.97 \times 10^7\ m^{-1}$

12. **Different spectral series have been and proved helpful in predicting the arrangement of the electrons in different**
    (a) Atoms (b) Elements
    (c) Molecules (d) Compounds

13. **The Balmer series contain wavelength in the _____ position of the hydrogen spectrum.**
    (a) Visible (b) Invisible
    (c) Opaque (d) Transparent

14. **The Lyman series contains the wavelength in the given region**
    (a) Infrared region (b) Violet region
    (c) Ultrared region (d) Ultraviolet region

15. **In Paschen series n =?**
    (a) n = 4,5,6 _____ (b) n = 3,4,5 _____
    (c) n = 1,2,3 _____ (d) n = 0,1,2,3, _____

16. **Which scientist formulated a model of hydrogen atom in 1913?**
    (a) Newton (b) Rutherford
    (c) Neils Bohr (d) Einstein

17. **Neils Bohr, in 1913, formulated a model of hydrogen atom utilizing a _____ and _____ theory.**
    (a) Classical physics and Planck's quantum theory
    (b) Theory of relativity and Einstein theory
    (c) Theory of Pasteur and Levoiser theory
    (d) Theory of law of conservation and energy theory

18. **Bohr's theory of a model of an atom of hydrogen consists of**
    (a) Three postulates (b) Two postulates
    (c) Five Postulates (d) One postulate

19. **An electron can move around the nucleus in circular orbits called**
    (a) Non discrete stationary states of the atom
    (b) Discrete stationary states of the atom
    (c) Any arbitrary stationary states of the atom
    (d) Non descriptive stationary states of the atom

20. **Angular momentum of an electron can be given as**
    (a) $mvr = \frac{nh}{2\pi}$ (b) $mvr = \frac{nhv}{2\pi}$
    (c) $mvr = \frac{nn^{-}h^2}{2\pi}$ (d) $mvr = \frac{2\pi}{nh}$

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21. Which of these series in the line spectrum of hydrogen lies in the visible region of the electromagnetic spectrum?
(a) Lyman series (b) Balmer series
(c) Paschen series (d) Pfund series

22. The energy of an electron in the 3rd orbit(n) is 5 and after falling from high energy orbit (3rd) to the 1st orbit (low (p) energy), it emits a photon of frequency
(a) $hf = E_n - E_p$ (b) $hf = \frac{1}{E_n - E_p}$
(c) $\frac{1}{hf} = E_n - E_p$ (d) $hf = E_n + E_p$

23. According to de-Broglie's hypothesis
(a) $\lambda = \frac{h}{p}$ (b) $\grave{\lambda} = \frac{h}{mv}$
(c) None of these (d) Both a and b

24. Helium was first discovered in the
(a) Stars (b) Sun
(c) Earth (d) Moon

25. For hydrogen atom r_1=
(a) 0.053 nm (b) 0.00530 nm
(c) 0.000503 nm (d) 0.0000.53 nm

26. Ionization energy of an electron of a hydrogen atom is E_o
(a) 13.6 ev (b) -13.6 ev
(c) 13.06 ev (d) -.0136 ev

27. Total energy of an electron in the Bohr orbit is E_o the sum of
(a) Kinetic energy and potential energy
(b) Gravitational energy and centripetal energy
(c) Nuclear energy and the atom energy
(d) Electrical energy and electrostatic energy

28. Energy required to completely remove an electron from the first Bohr orbit is called as
(a) Nuclear energy (b) Atomic energy
(c) Electrostatic energy (d) Ionization energy

29. Lowest energy state corresponding to n = 1 is called as
(a) Ground state (b) Excited state
(c) Normal state (d) Both a and c

30. The potential value which can lift the electron from ground to some high state is called as
(a) Excitation potential (b) Ionization potential
(c) Ground potential (d) None of these

31. X-rays are produced due to the
(a) Small energy differences (b) Small distance differences

(c) Small wave size differences (d) Small electron size differences

32. The arrangement of electrons in concentric shells are labelled as
(a) IL, L, M, N, O etc (b) M,N,O,P, Q, etc
(c) A,B,C,D,E, etc (d) U,V,W,X,Y,Z etc

33. The x-rays are characterised by their
(a) Wavelength (b) Frequency
(c) Velocity (d) Both a and b

34. The study of x-ray spectra help the study of
(a) Atomic structure (b) Molecular structure
(c) Periodic table of element (d) Both a and c

35. Which of these electrons are tightly bound to the nucleus?
(a) Inner shell electron (b) Outer shell electron
(c) Middle shell electron (d) None of these

36. The second Bohr orbit's contains radii
(a) 4r (b) 9r
(c) 16r (d) r1

37. The orbital electrons have _____amount of energy.
(a) Specific (b) Infinite
(c) Finite (d) Zero

38. Violet region lies in the _____range.
(a) 656 nm (b) 486 nm
(c) 434 nm (d) 410 nm

39. For P fund series n =
(a). 4,5,6, _____ (b) 1,2,3, _____
(c) 6,7,8, _____ (d) 5,6,7, _____

40. For Brackett series $\frac{1}{\lambda}$=
(a) $R_H\left[\frac{1}{3^2} - \frac{1}{n^2}\right]$ (b) $R_H\left[\frac{1}{4^2} - \frac{1}{n^2}\right]$
(c) $R_H\left[\frac{1}{5^2} - \frac{1}{n^2}\right]$ (d) $R_H\left[\frac{1}{1^2} - \frac{1}{n^2}\right]$

41. The transition of K-shell electron the inner shell electron producing a x-ray known as
(a) K_β x–ray (b) K_2 x–ray
(c) K_c x–ray (d) K_a x–ray

42. The energy of x-ray depends on the
(a) Target material (b) Incident material
(c) Emission material (d) Photon emitted

43. The continuous effect is caused by an effect known as
(a) Quantum effect
(b) Photo-electric effect

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(c) Bremsstrahlung or braking radiation
(d) Both a and b

44. X-ray can penetrate several _____into a solid.
(a) Centimeters (b) Kilometers
(c) Metres (d) Grams

45. Fractured bones or defects in structural steel can be detected by the use of
(a) Cathode rays (b) α-rays
(c) X-rays (d) β-rays

46. In the recent past, one widely system used several vastly improved x-ray technique and this instrument used in this system is called as
(a) CAT-scanner (b) Computers
(c) Projectors (d) Geiger counter

47. Tumors can be detected by
(a) CAT-Scans (b) Geiger counter
(c) Laser (d) Pinhole cameras

48. In some cases x-rays can cause
(a) Cancer (b) Diarrhoea
(c) Brain stroke (d) Heart diseases

49. Which radiations particularly affect the (even) parent's offspring?
(a) X-rays damage (b) Cathode rays damage
(c) β-rays damage (d) α-rays damage

50. The dual nature of matter is proved by simultaneous measurement of the position and _____of a particle.
(a) Frequency (b) Energy
(c) Wavelength (d) Momentum

51. Typical nuclei are less than _____in radius.
(a) 10^{-13} m (b) 10^{-14} m
(c) 10^{-14} cm (d) 10^{-13} cm

52. For the electron to be confined to a nucleus, its speed would have to be
(a) 10^{10} ms^{-1} (b) 10^{8} ms^{-1}
(c) 10^{9} ms^{-1} (d) 10^{6} ms^{-1}

53. LASER is the acronym for
(a) Light amplification by stimulated emission of radiation
(b) Light absorption by surrounded emission of radiation
(c) Light adsorption by surrounded emission of radiation
(d) None of these

54. In the excited state say E_3, the atoms can reside only for
(a) 10^{-3} s (b) 10^{-8} s
(c) 10^{-7} s (d) 10^{-2} s

55. In the metastable state the atom can reside only for
(a) 10^{-3} s (b) 10^{-8} s
(c) 10^{-7} s (d) 10^{-2} s

56. The situation that the metastable state (E_2) contains more atoms than ground state (E_1) is called as
(a) X-ray production (b) Population inversion
(c) Inhalation production (d) Laser damage

57. In the LASER to stimulate further emission from other excited atoms _____ is used.
(a) Mirrors (b) Lenses
(c) Target atoms (d) None of these

58. _____is a most common of laser used in physics laboratories.
(a) Helium-Neon laser (b) Nitrogen-Helium laser
(c) Helium-hydrogen laser (d) Both b and d

59. In Helium-Neon laser, discharge tube is filled with _____ and 15% neon gas.
(a) 95% Helium (b) 85% Helium
(c) 75% Helium (d) 25% Helium

60. In Helium-neon laser _____ is the losing or active medium in discharge tube.
(a) Helium (b) Neon
(c) None of these (d) Both a and b

61. In Helium-neon laser, by chance, helium and neon have nearly identical _____states.
(a) Metastable states (b) Excited states
(c) Ground states (d) All of these

62. By chance, helium and neon have nearly identical metastable states respectively located 20.61 eV and ____ level.
(a) 20.66 eV (b) 20.00 eV
(c) 00.00 eV (d) 20.66 j/K mol

63. The K.E. of the moving atom in the Helium – neon laser is
(a) 5 eV (b) 0.05 eV
(c) 0.005 eV (d) All of these

64. Which of these is used as surgical tools for welding detached retinas.
(a) Laser (b) X-ray
(c) Both a and b (d) None of these

65. Laser beams can be used to generate three dimensional images of objects in a process called as
(a) Physiotherapy (b) Holography
(c) Photography (d) Geography

66. Can be used for telecommunication along optical fibres.
(a) X-rays (b) Laser

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(c) Cathode rays (d) α-rays

67. The heat of the laser seals off capillaries and lymph vessels to prevent _____of the disease.
(a) Spread (b) Decrease
(c) Increase (d) Clotting

68. The use of laser technology in the field of ____is widespread.
(a) Ophthalmology (b) Geology
(c) Holography (d) Physiotherapy

69. In CAT scanning a _____array of x-ray beams is directed through the patient from a number of different orientation.
(a) Fanned-out (b) Fanned-in
(c) Fanned-up (d) Fanned-down

70. The wavelength of red laser light is
(a) 630.8 nm (b) 631.8 nm
(c) 632.8 nm (d) 633.8 nm

71. The radii of different stationary orbits of the electrons in the hydrogen atom are given by
(a) $m = r_1, 4r_1, 9r_1, 16r_1$ (b) $m = r_1, 8r_1, 18r_1, 32r_1$
(c) $m = r_1, 3r_1, 9r_1, Kr_1$ (d) Both b and c

72. For n = 1, 2, 3 ..... We get the allowed energy levels of hydrogen atom to be
(a) $E_n = E_o \frac{E_o}{4}, \frac{E_o}{9}, \frac{E_o}{16}, ...$
(b) $E_n = -E_o - \frac{E_o}{4}, -\frac{E_o}{9}, -\frac{E_o}{16}, ...$
(c) $E_n = +E_o + \frac{E_o}{4}, +\frac{E_o}{9}, +\frac{E_o}{16}, ...$
(d) None of these

73. The speed of the electron in the first Bohr orbit
(a) $2.19 \times 10^6\ ms^{-1}$ (b) $3.19 \times 10^6\ ms^{-1}$
(c) $2.00 \times 10^6\ ms^{-1}$ (d) $2.19 \times 10^7\ ms^{-1}$

74. The total energy of an electron when K.E. = 5 eV and P.E. 7ev is
(a) 14 eV (b) 12 eV
(c) 2 eV (d) 0 eV

75. The wavelength of light appears first in the emission spectra is
(a) Violet (b) Red
(c) Blue (d) Green

76. The value of $\frac{1}{\lambda}$ when n = 0 is $(\frac{1}{\lambda} = R_H\left[\frac{1}{12} \cdot \frac{1}{n^2}\right]$
(a) $1.0974 \times 10^7\ m^{-1}$ (b) $1.0974 \times 10^8\ m^{-1}$
(c) $1.097 \times 10^6\ m^{-1}$ (d) $1.0974 \times 10^{10}\ m^{-1}$

77. In the energy level diagram _____series occupy the 1st region and have -13.60 ev of energy.
(a) Lyman (b) Paschen
(c) Pfund (d) Balmer

78. In $mvr = \frac{nh}{2\pi}$, n in called the
(a) Principal quantum number (b) Azimuthal quantum number
(c) Magnetic quantum number (d) Both b and d

79. In $mvr = \frac{nh}{2\pi}$, h is called the
(a) Planks constant (b) Planck's constant
(c) Plant constant (d) Both a and c

80. X-rays are useful as well as
(a) Dangerous (b) Expensive
(c) Simple (d) Difficult

81. The K.E. of the electron is _____ when $f_{max} = 1$
(a) 6.63×10^{-34} j.s (b) 6.30×10^{-33} j.s
(c) 6.66×10^{-34} j.s (d) 6.30×10^{-32} j.s

82. The 1st useful discovery that brought great revolution is
(a) X-ray (b) Laser
(c) Pinhole camera (d) Computers

83. For Paschen series, n =
(a) 2,3,..... (b) 3,4,.....
(c) 4,5,..... (d) 1,2,.....

84. For Pfund series, n =
(a) 5,6,7, ... (b) 6,7,8, ...
(c) 1,2,3, ... (d) 0,1,2, ...

85. X-rays are high _____ rays.
(a) Frequency (b) Wavelength
(c) Length (d) Diameter

86. In laser _____light is used.
(a) Diffused light (b) Monochromatic
(c) Bright light (d) Both a and c

87. With CAT scans, density difference of___% can be detected.
(a) One (b) Two
(c) Three (d) Five

88. X-rays are useful for _____ destruction of cancer cells.
(a) Selective (b) Particular
(c) All (d) Normal

89. During the production of characteristic x-ray the graph is plot between _____ and_____.
(a) Wavelength and intensity (b) Wavelength and frequency

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(c) Wavelength and velocity (d) None of these

90. **For the electron, to be confined to a nucleus its speed would be greater than the speed of**
(a) Light (b) Moon
(c) Sun (d) Earth

91. **The darkening of the film during use of x-ray is proportional to the**
(a) Wavelength exposure (b) Radiation exposure
(c) Frequency exposure (d) Intensity exposure

92. **During the use of X-rays, the shadow of bones appears light due to high _____than flash.**
(a) Atomic number (b) Atomic weight
(c) Atomic size (d) Atomic diameter

93. **R_H is the Rydberg constant and is given by the equation**
(a) $R_H = \frac{E_o}{hc}$ (b) $R_H = \frac{E_o}{M}$
(c) $R_H = \frac{E_o}{h}$ (d) $R_H = \frac{E_o}{E_n}$

94. **The speed of electron in a hydrogen atom can be calculated by using the formula**
(a) $V_n = \frac{2\pi Ke^2}{nh}$ (b) $V_n = \frac{2\pi^2K^2e^4}{n^2h^2}$
(c) $V_n = \frac{4\pi^2K^2e^4}{n^2h^2}$ (d) $\frac{4\pi Ke^2}{nh}$

95. **The atomic weight of hydrogen atom is**
(a) 1 a.m.u (b) 2 a.m.u
(c) 0 a.m.u (d) 4 a.m.u

96. **1st of all _____hypothesis justified the H-atom model proposed by Bohr.**
(a) Je-Broglie's (b) Newton's
(c) Einstein's (d) Graham's

97. **The wavelength of blue green light is**
(a) 656 nm (b) 486 nm
(c) 434 nm (d) 410 nm

98. **Spectrometer is used for the measurement of**
(a) X-rays (b) Laser
(c) Line spectra (d) Photons

99. **X-rays can be reflected, refracted diffracted and _____ just like any other waves.**
(a) Polarized (b) Bent
(c) Rotate (d) Both b and c

100. **The wavelength of blue green light is greater than**
(a) Red light (b) Blue light
(c) Violet (d) Both b and c

ANSWERS

1.	c	2.	b	3.	a	4.	b	5.	a
6.	b	7.	b	8.	b	9.	a	10.	b
11.	b	12.	a	13.	a	14.	b	15.	a
16.	c	17.	a	18.	a	19.	b	20.	a
21.	b	22.	a	23.	d	24.	b	25.	a
26.	b	27.	a	28.	d	29.	d	30.	a
31.	a	32.	a	33.	d	34.	d	35.	a
36.	a	37.	a	38.	d	39.	c	40.	b
41.	b	42.	a	43.	c	44.	a	45.	b
46.	a	47.	a	48.	a	49.	a	50.	d
51.	b	52.	a	53.	a	54.	b	55.	a
56.	b	57.	a	58.	a	59.	b	60.	b
61.	a	62.	a	63.	b	64.	a	65.	b
66.	b	67.	a	68.	a	69.	a	70.	c
71.	a	72.	b	73.	a	74.	b	75.	b
76.	a	77.	a	78.	a	79.	b	80.	a
81.	a	82.	a	83.	b	84.	b	85.	a
86.	b	87.	a	88.	a	89.	a	90.	a
91.	b	92.	a	93.	a	94.	a	95.	a
96.	a	97.	b	98.	c	99.	a	100.	d

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NUCLEAR PHYSICS

1. Neutron was discovered by
   (a) Ernest Rutherford (b) James Chadwick
   (c) J.J. Thomson (d) Neil Bohr

2. All the positive charge of the atom and its _____ mass is concentrated in nucleus.
   (a) 0.1 % (b) 10%
   (c) 83.7% (d) 99.9%

3. The radius of an atom is approximately _____time the radius of the nucleus.
   (a) 10 (b) 100
   (c) 10,000 (d) 100,000

4. Which of the following particles exist outside the nucleus?
   (a) Electron (b) Proton
   (c) Neutron (d) All of these

5. The charge on a proton is
   (a) 1.6×10^{-19} C (b) 9.11×10^{-31} C
   (c) 1.6×10^{-27} C (d) 1C

6. The mass of the proton is
   (a) 1.6×10^{-19} kg (b) 1.67×10^{-27} kg
   (c) 9.11×10^{-31} kg (d) 1.67×10^{27} kg

7. The charge on a neutron is
   (a) 0 (b) 1.6×10^{-19} C
   (c) 1.6×10^{-27} C (d) 9.11×10^{-31}C

8. 1 a.m.u is defined as the one twelfth of the mass of
   (a) H^1 (b) C^{12}
   (c) N^{14} (d) O^{16}

9. In unified scale of mass, the mass of the proton is
   (a) 0.00055 u (b) 1.008665 u
   (c) 1.008665 u (d) 1.67×10^{-27} u

10. The mass of the neutron is
    (a) 0.00055 u (b) 1.007276 u
    (c) 1.008665 u (d) 1.67×10^{-27} u

11. The mass of an electron is
    (a) 0.00055 u (b) 1.6×10^{-27} u
    (c) 9.11×10^{-34} u (d) 1.007276 u

12. Atom as a whole is electrically
    (a) Positive (b) Negative
    (c) Neutral (d) Charged

13. The number of the protons inside a nucleus is _____ the number of electrons outside the nucleus.
    (a) Greater than (b) Less than
    (c) Equal to (d) Twice

14. The number of _____ present in the atom is call its atomic number.
    (a) Protons (b) Electrons
    (c) Neutron (d) Any of the above

15. The mass number is defined as the combined number of
    (a) Electron and proton (b) Electron and neutron
    (c) Positive and negative charges (d) Proton and neutron

16. The mass number of Helium is
    (a) 2 (b) 4
    (c) 6 (d) 1

17. The number of neutrons in $_{92}U^{235}$ is
    (a) 92 (b) 235
    (c) 143 (d) 327

18. Isotopes are defined as the atoms of an element having same number of protons but number of _____is different.
    (a) Electrons (b) Neutrons
    (c) Charges (d) All of these

19. The number of isotopes of hydrogen is
    (a) 1 (b) 2
    (c) 3 (d) 4

20. The heaviest isotope of hydrogen is
    (a) Protium (b) Deuterium
    (c) Tritium (d) None of these

21. The number of neutrons in protium is
    (a) 0 (b) 1
    (c) 2 (d) 3

22. The number of isotopes of xenon is
    (a) 3 (b) 12
    (c) 17 (d) 36

23. The chemical properties of an element depend on its number of
    (a) Electron (b) Proton
    (c) Neutron (d) All of these

24. The device which is used to separate the isotopes of an element as well as far the measurement of their mass is called
    (a) Laser (b) Microscope
    (c) Spectrometer (d) Mass spectrograph

25. The mass of the each ion reaching the detector of mass spectrograph is proportional to
    (a) Applied voltage (b) Square of applied voltage

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(c) Magnetic field intensity
(d) Square of the magnetic field intensity

26. Naturally occurring neon has _____isotopes.
(a) 3 (b) 5
(c) 9 (d) 17

27. The most abundant isotope of neon is
(a) Neon-20 (b) Neon-21
(c) Neon-22 (d) Neon-23

28. The mass of nucleus is always _____the mass of all the nucleons making up the nucleus.
(a) Less than (b) Greater than
(c) Equal to (d) Half

29. The difference between the total mass of the nucleons and the mass of nucleus is called
(a) Inertia (b) Atomic mass
(c) Mass defect (d) All of these

30. With usual notations the biding energy is given by the relation
(a) $B.E = \frac{1}{2}mV^2$
(b) $B.E = ZmpC^2$
(c) $B.E = ZmpC^2 - (A-Z)m_nC^2$
(d) $B.E = Zm_pC^2 + (A-Z)m_nC^2 - mC^2$

31. The mass defect of hydrogen is
(a) 0 (b) 0.003 a.m.u
(c) 0.00059 a.m.u (d) 1.007276 a.m.u

32. The binding energy of Helium is
(a) 0 (b) 28.2 MeV
(c) 56 MeV (d) 931 MeV

33. According to Einstein's mass-energy equation
(a) 1 u = 28.2 MeV (b) 1 u = 7.05 MeV
(c) 1 u = 4MeV (d) 1u = 931 Mev

34. The binding energy per nucleon is maximum for
(a) Hydrogen (b) Zinc
(c) Iron (d) Uranium

35. Which of the following elements has the minimum binding energy?
(a) Fe (b) C
(c) O (d) P

36. Which of the following elements has the maximum binding energy?
(a) Xe (b) Bi
(c) W (d) U

37. The natural radioactivity is shown by the elements having atomic number greater than
(a) 17 (b) 36
(c) 56 (d) 82

38. The radioactive elements can emit the radiations of _____ types.
(a) 2 (b) 3
(c) 4 (d) 5

39. Radioactivity was discovered by
(a) Werner Heisenberg (b) Albert Einstein
(c) J.J. Thomson (d) Henri Becquerel

40. Marie curie and Pierre curie discovered two radioactive elements called
(a) Uranium and Xenon (b) Radon and platinum
(c) Polonium and radium (d) Tungsten and bismuth

41. The first discovered radioactive element was
(a) Uranium (b) Xenon
(c) Radium (d) Platinum

42. X-rays are consisted of _____ particles.
(a) Positively charged (b) Negatively charged
(c) Neutral (d) Any of the above

43. β-rays are consisted of _____ particles.
(a) Positively charged (b) Negatively charged
(c) Neutral (d) Any of the above

44. γ-rays are consisted of _____ particles.
(a) Positively charged (b) Negatively charged
(c) Neutral (d) Any of the above

45. α-particles are _____nuclei.
(a) Hydrogen (b) Helium
(c) Boron (d) Uranium

46. The mass of an α-particle is
(a) 1 u (b) 2 u
(c) 3 u (d) 4 u

47. β-particles are actually fast moving
(a) Electrons (b) Protons
(c) Neutrons (d) Any of the above

48. The wavelength of γ-rays is _____ the wavelength of X-rays.
(a) Less than (b) Greater than
(c) Equal to (d) Double

49. Which of the following is true for radioactivity?
(a) It is purely a nuclear phenomenon
(b) It is not affected by chemical reaction
(c) It is not affected by physical change
(d) All of these

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50. Which of the following conservation law is applicable during radioactive decay?
(a) Mass (b) Energy
(c) Charge (d) All of these

51. Whenever an α-particle is emitted out of a radioactive element, its mass is decreased by
(a) 1 u (b) 2 u
(c) 3 u (d) 4 u

52. Whenever an α-particle is emitted out of a radioactive element, its charge number is decreased by
(a) 1 (b) 2
(c) 3 (d) 4

53. The emission of α-particle from radium results in the formation of
(a) Uranium (b) Palladium
(c) Radon (d) Xenon

54. When a β-particle is emitted out of a radioactive element its mass number is decreased by
(a) 1 (b) 2
(c) 4 (d) None

55. The emission of β-particles causes the charge number to increase by
(a) 1 (b) 2
(c) 3 (d) 4

56. After emission of β-particle, thorium is transformed into
(a) Protactinium (b) Palladium
(c) Platinum (d) Uranium

57. When a γ-radiation issues out of nucleus, which of the following does change?
(a) Mass number (b) Charge number
(c) Both of the above (d) None of these

58. The number of decaying atoms in a radioactive element is proportional to
(a) Temperature (b) Pressure
(c) Atomic number (d) Number of atoms

59. The number of decaying atoms in a radioactive element is given by the relation
(a) $\Delta N = N\Delta t$ (b) $\Delta N = \lambda N\Delta t$
(c) $\Delta N = -\lambda N\Delta t$ (d) $\Delta N = -\frac{N\Delta t}{\lambda}$

60. The unit of decay constant is
(a) m (b) ms^{-1}
(c) S (d) S^1

61. If N_o be the original number of atoms of radioactive element then after n half life the atoms left behind are
(a) $\frac{1}{2}N_o$ (b) $\frac{1}{2}n\,N_o$
(c) $2^n\,N_o$ (d) $\left(\frac{1}{2}\right)^n N_o$

62. The half life of uranium -238 is
(a) 5 days (b) 4 years
(c) 4.5×109 years (d) 17 minutes

63. The half life of uranium - 239 is
(a) 3.8 days (b) 23.5 minutes
(c) 1620 years (d) 50 seconds

64. Decay constant and half life is related by the equation
(a) $T_{1/2} = 0.693\lambda$ (b) $T_{1/2} = 2\lambda$
(c) $T_{1/2} = (0.693)^2\lambda$ (d) $T_{1/2}\lambda = 0.693$

65. The range of the radioactive particles depends on
(a) Charge (b) Mass
(c) Energy (d) All of these

66. α-particle is _____times massive than an electron.
(a) 10 (b) 300
(c) 3900 (d) 7000

67. The ionization ability of β-particle is _____times less than of α-particle.
(a) 2 (b) 10
(c) 100 (d) 1000

68. The range of β-particles is _____times less than that of α-particles.
(a) 10 (b) 100
(c) 1000 (d) 10,000

69. The intensity of a beam after passing through a distance 'X' in the medium is reduced to intensity I given by
(a) $I = I_o\,X^{-2}$ (b) $I = I_o\,X^2$
(c) $I = I_o\,e^{-2x}$ (d) $I = I_o\,e^{-\mu x}$

70. Which of the following has maximum range?
(a) α-rays (b) β-rays
(c) γ-rays (d) All have equal ranges

71. Which of the following is a radiation detector?
(a) Wilson Cloud Chamber (b) Geiger Counter
(c) Solid State Detector (d) All of these

72. In Wilson Cloud Chamber, α-particles leave_____ tracks.
(a) Thin (b) Continuous

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(c) Discontinuous (d) No definite

73. In Wilson Cloud Chamber β-particles leave _____ tracks.
(a) Thick (b) Continuous
(c) Discontinuous (d) No definite

74. The dead time of the Geiger Counter is approximately
(a) 10 sec (b) 10^{4} sec
(c) 10^{-2} sec (d) 10^{-4} sec

75. The quenching gas must have an ionization potential _____ that of principal gas in Geiger Counter.
(a) Lower than (b) Greater than
(c) Equal to (d) Double of

76. A solid state detector is a specially designed _____ junction.
(a) p-n (b) n-p-n
(c) p-n-p (d) None of these

77. The energy required in solid state detector to produce electron-hole pair is about
(a) 3-4 J (b) 3-4 eV
(c) 3-4MeV (d) 0.2 – 0.4 MeV

78. Which of the following detector has an edge over others?
(a) Wilson Cloud Chamber (b) Geiger Counter
(c) Solid State Detector (d) None of these

79. It was _____ who first expressed that artificial radio-activity can occur.
(a) H. Becquerel (b) Rutherford
(c) M. Curie (d) P. Curie

80. Which of the following is produced when $^{14}_{7}N$ is bombarded with an α-particle?
(a) $_{6}C^{12}$ (b) $_{8}O^{17}$
(c) $_{9}F^{18}$ (d) $_{17}C\ell^{35}$

81. Cyclotron is sued to accelerate
(a) Electrons (b) Protons
(c) Neutrons (d) None of these

82. Complete the following reaction $_{4}Be^{9} + _{2}He^{4} \longrightarrow _{6}C^{12} +$
(a) $_{1}H^{1}$ (b) $_{1}H^{2}$
(c) $_{1}H^{3}$ (d) $_{0}n^{1}$

83. Which of the following particle can enter the nucleus most easily?
(a) α-particle (b) Electron
(c) Proton (d) Neutron

84. Such a reaction in which a heavy nucleus splits up into two nuclei of comparable sizes with emission of energy is called
(a) Fission (b) Fusion
(c) Radioactivity (d) Ionization

85. Fission reaction was first discovered by
(a) Marie Curie and Pierre Curie
(b) Henri Becquerel
(c) Otto Hahn and Fritz Strassmann
(d) Davisson and Germer

86. Complete the following fission reaction
$_{92}U^{235} + _{0}^{1}n \longrightarrow _{56}Ba^{141} + ---+ 3_{0}n^{1} + q$
(a) $_{36}Kr^{92}$ (b) $_{36}Zn^{92}$
(c) $_{36}Pd^{92}$ (d) $_{36}Xe^{92}$

87. The energy released in the fission of one Uranium nucleus is
(a) 931 MeV (b) 35 MeV
(c) 200 MeV (d) 1.6×10^{-19} MeV

88. The binding energy per nucleon for uranium is
(a) 0.4 MeV (b) 7.7 MeV
(c) 200 MeV (d) 931 MeV

89. In human body radio iodine is absorbed by
(a) Bones (b) Liver
(c) Thyroid gland (d) Heart

90. The circulation of blood is studied by
(a) Sodium -24 (b) Oxygen-17
(c) Carbon-14 (d) Nitrogen-15

91. The number of basic forces is
(a) 2 (b) 3
(c) 4 (d) 5

92. The range of weak nuclear force is approximately
(a) 1 m (b) 1×10^{-4} m
(c) 1×10^{-11} m (d) 1×10^{-17} m

93. Which of the following is called hadron?
(a) Proton (b) Neutron
(c) Meson (d) All of these

94. The particles that do not experience strong nuclear force are called
(a) Hadrons (b) Leptons
(c) Quarks (d) Photons

95. Muons are the examples of
(a) Hadrons (b) Leptons
(c) Quarks (d) Photons

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96. **Quark theory was initiated by**
(a) M. Gell-Mann and G. Zweig (b) Garry and Anderson
(c) Rutherford (d) Dr. Abdus Slam

97. **A pair of quark and antiquark makes a**
(a) Neutrons (b) Leptons
(c) Mesons (d) Baryon

98. **3 quarks make a**
(a) Lepton (b) Meson
(c) Baryon (d) Hadron

99. **The neutron is assumed to be made up of _____ quark and _____ quark.**
(a) 1 up, 2 down (b) 2 up, 1 down
(c) 2 up, 2 down (d) 2 up, 3 down

100. **Weinberg and Abdus Salam was awarded Nobel Prize in 1979 for**
(a) Unification of electric and magnetic forces
(b) Discovery of weak nuclear forces
(c) Discovery of mesons
(d) Unification of electromagnetic and weak forces

ANSWERS

1.	b	2.	d	3.	d	4.	a	5.	a
6.	b	7.	a	8.	b	9.	b	10.	c
11.	a	12.	c	13.	c	14.	a	15.	d
16.	b	17.	c	18.	b	19.	c	20.	c
21.	a	22.	d	23.	a	24.	d	25.	d
26.	a	27.	a	28.	a	29.	c	30.	d
31.	a	32.	b	33.	d	34.	c	35.	b
36.	d	37.	d	38.	b	39.	d	40.	c
41.	a	42.	a	43.	b	44.	c	45.	b
46.	d	47.	a	48.	a	49.	d	50.	d
51.	d	52.	b	53.	c	54.	d	55.	a
56.	a	57.	d	58.	d	59.	c	60.	d
61.	d	62.	c	63.	b	64.	d	65.	d
66.	d	67.	c	68.	b	69.	d	70.	c
71.	d	72.	b	73.	c	74.	d	75.	a
76.	a	77.	b	78.	c	79.	b	80.	b
81.	b	82.	d	83.	d	84.	a	85.	c
86.	a	87.	c	88.	b	89.	c	90.	a
91.	d	92.	d	93.	d	94.	b	95.	b
96.	a	97.	c	98.	c	99.	a	100.	d

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IMPORTANT TOPICS

LASER

(Light Amplification by Stimulated Emission of Radiations.)

- Ordinary white light is made up of different colours with different wavelengths (frequencies).
- While laser is a device that amplifies light and produces a beam that is intense, coherent, monochromatic and pure in frequency and in colour.

Principle

In stimulated emission, a photon emitted from an atom induces an electron in another excited atom to fall immediately to a lower level and emit a photon identical to itself.

Energy is first pumped into laser material, raising most of the electrons return to a level just above the ground state. Initially, only a few atoms will spontaneously radiate photons.

Two silvered mirrors, one partially transparent, reflect the radiation back and forth repeatedly, inducing a chain reaction of photon emission.

- All the electrons return to the ground state almost simultaneously and a powerful pulse of laser light emerges from the partially silvered end.

Applications of Laser Light

General Uses

1. A laser can produce light of essentially single frequency.
2. Laser light is used in surveying and Ranging.

Application in Medicine

1. Dentists use laser light to removed decay from tooth.
2. Laser is used in eye surgery to weld retina that has become separated or detached from the back of the eye.

Holography

Laser allows production of three-dimensional images. The technique is called Holography.

SEMI-CONDUCTORS

A material, may be an element or a compound, that conducts electrical current less easily than does a metal such as copper but much better than an insulator such as glass or wood.

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DOPING

A process in which slight impurities are added into the pure semi-conductors to boost up their conducting properties.

N-type and P-type semi-conductors are obtained in this way.

N-Type Semi-conductors

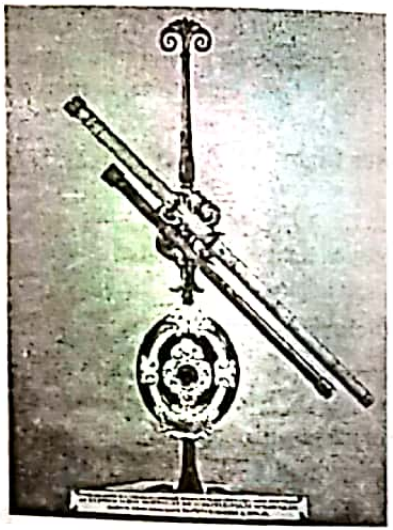
When pure silicon and germanium semi-conductor crystals are doped with electron donor impurities, like arsenic and antimony N-type semi-conductors are formed.

P-Type Semi-conductors

When pure silicon and germanium semi-conductor crystals are doped with electron deficient impurities, like boron and indium, P-type semi-conductors are formed.

TELESCOPE

- Telescopes are used to see far-away objects clearly which are brought nearer.
- Galileo was the first person to make an astronomical telescope in 1609.



Galileo's Telescope

Types

(a) Refracting Telescope

This is the simplest telescope. It consists of two lenses.

(b) Reflecting Telescope

Astronomers use reflecting telescope. This contains curved mirror as well as lenses.

(c) Radio Telescope

It is an instrument used in radio-astronomy to pick up and analyse the radio frequency of electromagnetic radiation of the extra-terrestrial sources.

RADIO

- The term radio covers the radiation and detection of signals propagated through space as electromagnetic waves to convey information.
- A radio wave is made up of electric and magnetic fields vibrating mutually at right angles to each other in space.

TIDAL ENERGY

- Tidal power is also known as tidal energy.
- This is the energy achieved by capturing the energy contained in moving water, in tides, oceans and currents.
- Tidal power is classified as a renewable energy source, because the tides are caused by the orbital mechanics of the solar system and are considered inexhaustible.
- The root source of the energy is the orbital kinetic energy of the earth-moon system, and also the earth-sun system.

SUPERSONICS

- Supersonics is the branch of physics dealing with the phenomenon arising when the velocity of a solid body exceeds the speed of sound in the medium, usually air, in which it is travelling.

HYPERSONIC

- Speeds greater than 5 times the speed of sound are sometimes referred to as Hypersonic.

THEODOLITE

- An optical instrument consisting of a small mounted telescope rotatable horizontal and vertical planes, used to measure angles in surveying, navigation and meteorology.
- Theodolite is used in triangular networks, for measuring both the horizontal and vertical angles.

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THERMISTOR

- A type of resistor used to measure temperature changes, relying on the changes in its resistance with changing temperature.

THERMOSTAT

- This is the for regulating the temperature of a system, so that the system's temperature is maintained near a desired set point of temperature.
- The thermostat does this by controlling the flow of heat energy into or out of the system.

PEDOMETER

- It is also known as step counter
- A usually portable and electronic, device, that is used for counting the steps of a person.

TELEMETER

- An instrument used for measuring the distance of an object from an observer, as a telescope with a micrometre for measuring the apparent diameter of an object whose real dimensions are known.
- Telemeter is a measuring instrument which sends the information obtained from its sensors by radio to the base station.

MULTIMETER

- A multimeter is an electronic messaging instrument that combines several functions in one unit.
- The most basic instrument includes an ammeter, voltmeter and ohmmeter.

PERIMETER

- Perimeter is the line drawn at the edge of an area or shape.

  Example: Perimeter of a rectangle is the sum of its four sides.
- The perimeter of a circle is known as circumference.

ALTIMETER

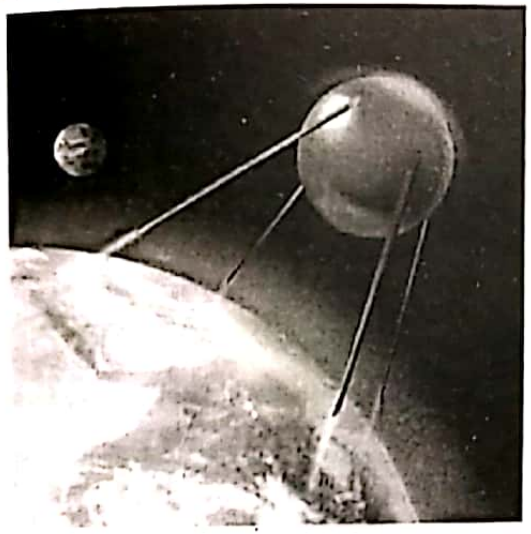
- Altimeter is an instrument used in aircraft to estimate altitude.
- Its usual essential feature is aneroid barometer, which registers the decrease of pressure with height.

PERISCOPE

- Periscope is the apparatus used for viewing objects lying above the sea level or eye level of the observer and whose direct vision is obstructed.
- It consists of a tube, bent twice at right angles and having plane mirrors in these bends, inclined at an angle of 45° to the tube.

SATELLITES

- Satellite is any object purposely placed into orbit around the earth, other planets or the sun.
- First artificial satellite was launched in 1957.
- Artificial satellites play a key role in the navigation, communication, meteorology, military intelligence and in the study of both earth and outer space.



First Artificial Satellites

Types of Satellites

Communication Satellite

- Almost all the satellites constitute some communication apparatus.
- These satellites in geostationary orbits provide voice, data and television communication, including the direct broadcast of television to homes around the world.

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Navigation Satellite

- Navigation satellite can help locate the position of ships, aircraft and even automobiles that are equipped with special radio receivers.
- A navigation satellite sends continuous radio signals to earth.
- These signals contain data that a special radio receiver on earth translates into information about the satellites position.

Weather Satellite

- Weather satellites carry cameras and other instruments pointed towards earth atmosphere.
- They can provide advance warning of severe weather and are a great aid to weather forecasting.

Military Satellite

- Many military satellites are similar to commercial ones, but they send corrupted data that only a special receiver can decipher.

Scientific Satellites

- Earth orbiting satellites can provide data to map earth, determine the size and shape of the earth and study the dynamics of the oceans and the atmosphere.
- They are also used to observe the sun, moon, planets, stars, etc.

FISSION AND FUSION REACTIONS

i. Fission

- Fission is a nuclear reaction in which the atom is split into two approximately equal masses.
- It is accompanied by the emission of extremely high quantities of energy.
- The energy is released by the Einstein's equation $e= mc^2$.

ii. Fusion

- Fusing of the nuclei of lighter elements such as hydrogen into those of a heavier element such as helium.
- The resultant loss, in their combined mass, is converted into energy.

RADIOACTIVITY

- Spontaneous emission of radiation either directly from unstable atomic nuclei or as a consequence of a nuclear reaction.
- The radiations include alpha particles, nucleons and gamma rays.
- Uranium 238 is a very unstable element, goes through eighteen stages of decay before becoming a stable isotope of lead 206.

FORCE

- Force is needed to measure or break the inertia of a system.
- Unit of force is Newton.

Newton

- Newton is the unit of force.
- It is the force needed to move 1kg mass, one metre per second, faster every second.

WORK

- May be defined as the product of force into distance.
- Measured in Joules.

POWER

- Rate of doing work in a unit time.
- It is pressure measured in watts or kilowatts.
- It is the force exerted on a unit area.

HYDROELECTRIC POWER

- Hydroelectric power means production of electricity by making dams.
- It is cheaper.
- It is pollution free.
- It can be used for irrigation purposes.

GEOTHERMAL ENERGY

Geo: earth

Therm: heat

- It is the utilisation of the heat of the earth.
- Cold water is pumped down through a pipe into the earth and is heated by the hot rocks.
- Another pipe brings the water or steam to the surface.
- The steam comes out at high pressure and is used to drive steam turbines for the generation of electricity.

ENERGY CONSERVATION

- Process in which energy is used most efficiently without any wastage in home appliances.
- By using compact electric florescent bulb.
- By efficient use of electricity.

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- By leading a simple life.

ELECTROMAGNETIC ENERGY

- Air contains millions of tiny fast moving particles.
- Waves of energy pass through the air too.
- This kind of energy is called electromagnetic energy, produced by the vibration of electricity and magnetism.

PETROCHEMICALS

- Substances that are obtained during the refining of crude petroleum.
  Examples: Ether, Benzene, Xylem, Toluene and Ethylene.

REVIEW YOUR KNOWLEDGE

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SAMPLE PRACTICE TEST – 1

1. If the applied voltage of a certain transformer is enhanced 50% and the frequency is reduced to 50% then the greatest core flux density will change to _____ of the original value.
   (a) Three times (b) Four times
   (c) Five times (d) None of these

2. A single phase transformer has ranking of 15 KVA 600 / 120 V. It is suggested as an auto transformer to supply at 720 V from a 600 V main source. _____it can supply is 90 kVA.
   (a) The maximum load (b) The average load
   (c) The least load (d) None of these

3. Compton scattering is the major interaction for_____.
   (a) Voltage radiation therapy energies
   (b) Megavoltage radiation therapy energies
   (c) Rayleigh scattering therapy energies
   (d) None of these

4. Pair production is a form of interaction between photons of very high_____.
   (a) Energy and neutrons (b) Energy and photons
   (c) Energy and matter (d) None of these

5. A person walked up a stalled moving staircase in 90s. When standing on the same moving staircase, he is carried up in 60s. How much time would it take him to walk up the moving staircase?
   (a) 36s (b) 50s
   (c) 70s (d) 86s

6. In what country was Albert Einstein born?
   (a) England (b) America
   (c) India (d) Germany

7. Radiation executes everything in its path, apart from if it is healthy. The aim of treatment is to _____as much as possible while trying to kill all cancer cells.
   (a) Spare healthy tissue (b) Spare normal tissue
   (c) Make healthy tissue (d) None of these

8. _____ won the Nobel Prize for Physics in 1921 for his work on the laws of the photoelectric effect.
   (a) Galileo Galilei (b) Hannes Olof Gosta
   (c) Albert Einstein (d) Francis Harry Compton

9. What did Einstein win a Nobel Prize for in 1922, 17 years after "Relativity" was first published?
   (a) Services to explanatory Physics
   (b) Services to geological Physics
   (c) Services to Theoretical Physics
   (d) None of these

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10. From the top of a building, a ball is thrown while another is thrown straight at the same time. Which ball will hit the ground first?
(a) First ball reaches the ground first
(b) Second ball reaches the ground first
(c) Both the balls reach the ground simultaneously
(d) None of these

11. Particle, smaller than an atom is called_____.
(a) Subatomic particle (b) Atomic particle
(c) Alpha particle (d) Beta particle

12. For every particle of matter _____is a corresponding particle with identical mass and spin but opposite charge.
(a) Antimatter (b) Radioactive
(c) Half life (d) None of these

13. When a radioactive source is implanted inside a tumour then this process is called_____.
(a) Radioactivity (b) Brachytherapy
(c) Thermal decomposition (d) None of these

14. A bar magnet is fluctuating in the earth's magnetic field with a period T. What occurs to its period and motion if its mass is quadrupled?
(a) Motion remains simple harmonic with time period is equal to 8
(b) Motion remains simple harmonic with time period is equal to 6
(c) Motion remains simple harmonic with time period is equal to 4
(d) Motion remains simple harmonic with time period is equal to 2

15. A charged element travels through a magnetic field in a direction at right angles to it. Then speed of the particle_____.
(a) Remains positive (b) Remains negative
(c) Remains unchanged (d) None of these

16. A ball of mass m_1 collides elastically and head on with another ball of mass m_2, originally at rest. In which of the following cases convey of momentum will be maximum?
(a) When m_1 is greater than m_2
(b) When m_2 is greater than m_1
(c) When both masses are equal
(d) None of these

17. The energy supplied to a hospital by the electricity board during an average December week day was 40Gwh. If this power could be attained by the maintenance of matter, how much mass would have to be consumed?
(a) 1.6 g (b) 1.8 g
(c) 2.5 g (d) 3.5 g

18. _____ is the point at which a teletherapy machine turns around.
(a) Isocentre (b) Centre
(c) Centre of gravity (d) None of these

19. In the Big Bang experiment, LHC stands for_____.
(a) Least Height Designer (b) Large Hadron Collider
(c) Large Hydrogen Collider (d) None of these

20. God particle is now known as _____.
(a) Gallileo's particles (b) Newton's particle
(c) Higgs Boson particle (d) Einstein's particle

21. The methane contents of natural gas of Pakistan are_____.
(a) 70-80% (b) 70-90%
(c) 80-90% (d) None of these

22. The folio wing statements regarding an RC phase-shift oscillator, _____is negative.
(a) The amplifier hammering (b) The amplifier gain
(c) The amplifier loss (d) None of these

23. One of the characteristics of photon is that _____.
(a) It has no weight (b) It has no mass
(c) It has no direction (d) None of these

24. Albert Einstein wrote his famous "Special Theory of Relativity" in _____.
(a) 1907 (b) 1906
(c) 1905 (d) 1904

25. By joining Einstein's equation $E = mc^2$ and another equation for energy $E = hf$, it is likely to obtain yet another formula which really shortens the entire concept of_____.
(a) Wave particle duality (b) Wave particle double theory
(c) Albert Einstein theory (d) None of these

26. The estimated capacity of Kalabagh dam to generate electricity is_____.
(a) 3500 MW (b) 3600 MW
(c) 4000 MW (d) 5900 MW

27. The deflection in a moving coil galvanometer falls from 50 partitions to 10. When a shunt of 12 Ω is applied then what is the resistance of the galvanometer?
(a) 40 Ω (b) 48 Ω
(c) 50 Ω (d) 56 Ω

28. A point article is positioned at the centre of a glass sphere of radius 6 cm and refractive index one and a half. The distance of the virtual image _____is 6cm.
(a) From the surface (b) From the surface of point
(c) From the surface of sphere (d) None of these

29. One type of fuel gas is _____.
(a) Nitrogen (b) Oxygen
(c) Natural gas (d) None of these

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30. According the work of Marie Curie, the smoke detector uses _____.
(a) Alpha Radiation (b) Beta Radiation
(c) Gamma Radiation (d) None of these

31. Muons belongs to _____category of fundamental particles.
(a) Protons (b) Neutrons
(c) Leptons (d) None of these

32. _____is defined as the amount of energy required to raise one pound of water by one degree Fahrenheit.
(a) German Thermal Unit (b) British Thermal Unit
(c) French Thermal Unit (d) None of these

33. An average value for the thermal energy of coal is approximately _____ kilowatt-hour (kwh)/ton.
(a) 6150 (b) 6350
(c) 6550 (d) 6750

34. A long spring is stretched by 2 cm, its potential energy is Z. If the spring is prolonged by 10 cm, then the potential energy in it will be_____.
(a) 15 Z (b) 25 U
(c) 35 Z (d) 45 Z

35. The vector sum of two forces is vertical to their vector difference. In that case, the forces are_____.
(a) Equal to other forces in magnitude
(b) Equal to each other but opposite in direction
(c) Unequal to each other in magnitude
(d) Equal to each other in magnitude

36. _____is the unit given to distances of around 10^{-15}m.
(a) Femtometre (b) Millimetre
(c) Decametre (d) None of these

37. Diamond is one of the natural allotropes of _____.
(a) Sodium (b) Carbon
(c) Silicon (d) None of these

38. The process which engrosses light nuclei joining mutually thus creating one larger nucleus is called _____.
(a) Fusion (b) Fission
(c) Momentum (d) None of these

39. The atom obtains its name from the Greek word atomos which means_____.
(a) Perceptible (b) Discernible
(c) Indivisible (d) Noticeable

40. Acceleration due to gravity on a planet is 9 times as compared to another planet. A man jumps to a height of 2m on the surface of first planet then what is the elevation of jump by the same person on other planet?
(a) 18m (b) 28m
(c) 38m (d) 48m

41. Diamonds have _____between their atoms which allows very little or no movement.
(a) Rigid bond (b) Ionic bond
(c) Covalent bond (b) Coordinate covalent bond

42. X-Rays are indirectly_____.
(a) Unionising radiation (b) Ionising radiation
(c) Polar radiation (d) None of these

43. _____is emanated by the hot metal filament in the cathode ray tube.
(a) Alpha particles (b) Electrons
(c) Protons (d) None of these

44. The proton is the _____particle.
(a) Fundamental (b) Most recent
(c) Most unimportant (d) None of these

45. Fuse wire is a wire of high resistance and_____.
(a) Low confrontation (b) Low boiling point
(c) Low melting point (d) None of these

46. Copper can be boiled at _____.
(a) 2567 °C (b) 2899 °C
(c) 3056 °C (d) 3278 °C

47. When a car is accelerating then_____ is a needed.
(a) Force of friction (b) Force of gravitation
(c) Centripetal force (d) None of these

48. _____therapy machines were the initial cancer treatment device.
(a) Cobalt-40 (b) Cobalt-50
(c) Cobalt-60 (d) Cobalt-70

49. A _____in a magnetic field goes from brawnier to the punier parts of the field.
(a) Mesmeric material (b) Diamagnetic material
(c) Magnetic material (d) None of these

50. If an inherent semiconductor is doped with a very little amount of boson then in the extrinsic semiconductor so farmed, the number of electrons and holes will_____ respectively.
(a) Decrease and increase (b) Only decrease
(c) Only increase (d) None of these

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ANSWERS

1.	a	2.	a	3.	b	4.	c	5.	a
6.	d	7.	a	8.	c	9.	c	10.	c
11.	a	12.	a	13.	b	14.	d	15.	c
16.	c	17.	a	18.	a	19.	b	20.	c
21.	b	22.	b	23.	b	24.	c	25.	a
26.	b	27.	b	28.	c	29.	c	30.	a
31.	c	32.	b	33.	a	34.	b	35.	d
36.	a	37.	b	38.	a	39.	c	40.	d
41.	a	42.	b	43.	b	44.	a	45.	c
46.	a	47.	a	48.	c	49.	c	50.	a

SAMPLE PRACTICE TEST – 2

1. **Glass can be found in nature from _____that are in the form of obsidian.**
   (a) Volcanic flows (b) Current flows
   (c) Photons flow (d) None of these

2. **The _____is the tau particle.**
   (a) Heaviest lepton (b) Heaviest Proton
   (c) Heaviest electron (d) None of these

3. **Bremsstrahlung X-rays were fashioned _____of electrons as they curve around the strong charge of the target nuclei.**
   (a) By the slowing down (b) By moving fast
   (c) With same speed (d) None of these

4. **_____is the boson that holds the brawny nuclear force.**
   (a) Gluon (b) Alpha particle
   (c) Beta particle (d) Gema particle

5. **Solar energy is largely reasoned due to fusion of protons through_____.**
   (a) Synthesis of heavier elements
   (b) Synthesis of gravitational contraction
   (c) Force of attraction (d) None of these

6. **The electromotive force persuaded in a conductor affecting at right angles to a magnetic field does not depend upon the _____.**
   (a) Resistance of the conductor (b) Resistance of the voltmeter
   (c) One of these (d) None of these

7. **26. In forced vibration, the resonance wave turns out to be _____ when the damping force is small.**
   (a) Extremely periodic (b) Extremely small
   (c) Extremely sharp (d) None of these

8. **_____ is the name of gauge boson.**
   (a) Electron (b) Photon
   (c) Neutron (d) None of these

9. **_____are used in transmission lines to reduce corona.**
   (a) Hollow conductors (b) Solid conductors
   (c) Concrete conductors (d) Hard conductors

10. **In a synchronous generator, an alienated winding rotor is preferable to a conventional winding rotor because of _____.**
    (a) Higher state stability limit (b) Steady state stability limit
    (c) Lower state stability limit (d) None of these

11. **Pions and Kaons belong to the _____ type of subatomic elements.**
    (a) Electrons (b) Mesons
    (c) Neutrons (d) None of these

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12. A model of radioactive ingredient has a mass of 10 g at a moment when time is equal to zero. _____after two mean lives is 1.35g.
(a) Estimated weight of this ingredient in the model
(b) Estimated mass of this ingredient in the model
(c) Estimated atomic mass of this ingredient in the model
(d) Estimated molecular mass of this ingredient in the model

13. In electrolysis, the mass put down on an electrode is _____ to current.
(a) Directly proportional (b) Inversely proportional
(c) Constant (d) None of these

14. A 500 kg vehicle takes an encircling turn of radius 50 m with a velocity of 36 km/h. The centripetal force is _____.
(a) 50N (b) 100N
(c) 1000N (d) 10000N

15. A light year is the distance that light travels in a year and is equal to about _____.
(a) 8.5 trillion kilometers (b) 9.5 trillion kilometres
(c) 10.5 trillion kilometers (d) 11.5 trillion kilometres

16. If v-t graph is a straight line then average acceleration and _____ are equivalent.
(a) Constantaneous acceleration
(b) Constantaneous velocity
(c) Constantaneous speed
(d) None of these

17. In _____ systems the radius of the first orbit will be lowest amount.
(a) Doubly ionised chlorine (b) Doubly ionised sodium
(c) Doubly ionised lithium (d) Doubly ionised helium

18. The maximum range of a firearm of horizontal land is 16 km. If $g = 10\ ms^2$ then silence velocity of a shell must be_____.
(a) 100 m/s (b) 200 m/s
(c) 400 m/s (d) 600 m/s

19. _____is the unit of distance.
(a) Parsec (b) Joule
(c) Dioptre (d) None of these

20. Glass is an example of _____.
(a) Amorphous solid (b) Equilateral solid
(c) Amorphous liquid (d) Amorphous gas

21. _____of a sound wave depends upon the shape of the wave.
(a) The quality (b) The speed
(c) The interference (d) None of these

22. A car is moving on a straight highway towards north with a uniform speed of 50 km/h when it twists through 90°. If the speed is left unaffected after turning, _____in the turning course is 70.7 km/h along south-west direction.
(a) The increase in the velocity of car
(b) The decrease in the velocity of car
(c) The increase in the direction of car
(d) None of these

23. An electric enthusiast has blades of length 30 cm calculated from the axis of rotary motion. If the enthusiast is revolving at 120 rpm, the acceleration of a point on the tip of the blade is _____.
(a) 16.5 m/s^2 (b) 17.4 m/s^2
(c) 23.7 m/s^2 (d) 30.5 m/s^2

24. In milk, cream gets separated due to_____.
(a) Centripetal force (b) Centrifugal force
(c) Horizontal force (d) Vertical force

25. The maximum range of radar can be increased by increasing the peak transmitted power and increasing_____.
(a) The radius of the antenna (b) The diameter of the antenna
(c) The radius of the focus (d) None of these

26. When a synchronous motor is running at synchronous speed, _____creates no torque.
(a) The damper winding (b) The damper torque
(c) The damper velocity (d) None of these

27. Two bodies of an equivalent mass are projected with the similar velocity at an angle of 30° and 60° respectively. The ratio of their _____ will be one and one.
(a) Horizontal diversity (b) Vertical diversity
(c) Uniformity (d) None of these

28. Suppose a body of mass 'm' is chucked with velocity 'v' at an angle of 30° to the horizontal and one more body of the identical mass is chucked with the similar speed at an angle of 60° to the horizontal, the ratio of _____of both bodies will be one and one.
(a) Analogous range (b) Corresponding range
(c) Horizontal range (d) Vertical range

29. _____ is the unit used to measure current.
(a) Joule (b) Ampere
(c) Ohm (d) Capacitance

30. W boson's superpartner is called_____.
(a) Crack (b) Work
(c) Wino (d) None of these

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31. Heat is measured in_____.
(a) Capacitance (b) Joules
(c) Ohm (d) None of these

32. Skewing of motor bars in a squirrel-cage induction motor prevents cogging and increases_____.
(a) Closing torque (b) Final torque
(c) Starting torque (d) None of these

33. The rotor power production of a 3-phase induction motor is 15kW and the equivalent slip is 4%. The rotor copper loss will be_____.
(a) 550 W (b) 625 W
(c) 700 W (d) 950 W

34. A ship is sent across a sea with a velocity of 8 km/h. If the consequential velocity of ship is_____, then velocity of sea is 6 km/h.
(a) 8 km/hr (b) 10 km/h
(c) 18 km/hr (d) 20km/hr

35. When a body moves with a constant speed along a circle then _____ is done on it.
(a) Its speed remains constant (b) No work
(c) No acceleration (d) None of these

36. _____ is the heaviest natural element.
(a) Nitrogen (b) Uranium
(c) Oxygen (d) None of these

37. _____ is not a vector quantity.
(a) Speed (b) Acceleration
(c) Strength (d) Dislodgment

38. A body is rotated in a level circle of radius 20 cm and it has an angular velocity of 10 rad/s. 2m/s is its _____on circular path.
(a) Linear average speed at any point
(b) Linear average acceleration at any point
(c) Linear velocity at any point
(d) Linear centripetal force at any point

39. The speed of a vessel is 5 km/h in still water. It crosses a stream of breadth 1 km along the direct possible path in 15 minutes. The velocity of the stream water is _____.
(a) 3 km/h (b) 5 km/h
(c) 10 km/h (d) 15 km/h

40. A ball of mass 0.25 kg closed to the end of a cord of length 1.96 m is moving in a horizontal circle. The cord will break if the tension is more than 25 N. The maximum speed with which the ball can be moved is _____.
(a) 14m/s (b) 18 m/s

(c) 25 m/s (d) 30 m/s

41. A sphere whose kinetic energy is, M' is thrown at an angle of 45° horizontally. Its _____of its flight will be M/2.
(a) Kinetic energy at the maximum point
(b) Kinetic energy at initial point
(c) Potential energy at centre point
(d) Potential energy at the maximum point

42. Calculate the current in a 5 ohm resistor when the potential difference between the ends of the resistor is 2.5 V?
(a) 0.40 A (b) 0.50 A
(c) 0.60 A (d) 0.70 A

43. _____ fuse should be utilised for a 750 W electric iron associated with a 240 V supply.
(a) 5 A (b) 15 A
(c) 25 A (d) 35 A

44. _____ term is used for expressing the weight of protons, neutrons and electrons.
(a) Planck's constant (b) Atomic mass unit
(c) Metre per second (d) None of these

45. _____ is the term derived from the Greek word for "matter."
(a) Ember (b) Ylem
(c) Positron (d) None of these

46. If an atom was about the size of a football field, what could symbolise the nucleus?
(a) Football (b) Basketball
(c) Cricket ball (d) None of these

47. Max Planck _____that some categories of energy could not take on any value.
(a) Hypothesised (b) Negated
(c) Accepted (d) None of these

48. _____ the name of the theory that narrates that all forces stem from one force that survived long ago.
(a) Grand unified theory (b) Newton force theory
(c) Golden Brown theory (d) None of these

49. For measuring resistance instantly, the most helpful device is the _____.
(a) Stopwatch (b) Iron rod
(c) Ohmmeter (d) None of these

50. _____ is not a good magnet.
(a) Copper (b) Cobalt
(c) Nickel (d) None of these

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ANSWERS

1.	a	2.	a	3.	a	4.	a	5.	a
6.	a	7.	c	8.	b	9.	a	10.	b
11.	b	12.	c	13.	a	14.	c	15.	b
16.	c	17.	c	18.	c	19.	a	20.	b
21.	a	22.	a	23.	c	24.	b	25.	a
26.	a	27.	a	28.	c	29.	b	30.	b
31.	b	32.	c	33.	b	34.	b	35.	c
36.	b	37.	a	38.	c	39.	a	40.	b
41.	a	42.	b	43.	a	44.	b	45.	a
46.	a	47.	a	48.	a	49.	c	50.	b

SAMPLE PRACTICE TEST – 3

1. **Gravity gets _____ as one gets nearer to the earth's core.**
   (a) Hurried (b) Stronger
   (c) Frivolous (d) None of these

2. **What will be the angle between two vectors of magnitude 12 and 18 units when their resultant is 24 units?**
   (a) 75°52' (b) 77°51'
   (c) 79°19' (d) 80°19'

3. **A man has a weight of 80 kg and he stands on a weighing machine in a lift which is moving upwards with a uniform acceleration of 5 m/s^2. What would be the analysis on the scale if g = 10 m/s^2?**
   (a) 1000 N (b) 1200 N
   (c) 600 N (d) 500 N

4. **A man goes to swim in a stream planning to arrive at accurately opposite point on the bank of the stream. His speed of swimming is 0.5 m/s at an angle of 120° with the direction of flow of water. The speed of water in stream is_____.**
   (a) 0.25 m/s (b) 0.50 m/s
   (c) 0.75 m/s (d) 0.95 m/s

5. **Two projectiles are fired up from the same position with the similar speed at angles of projection 60° and 30° respectively. Their _____ will be same.**
   (a) Time period (b) Range
   (c) Viscosity (d) Time of flight

6. **A marble piece joined with a string, is turned in a perpendicular circle. _____ with which the piece has to be rotated is independent of the mass of the stone.**
   (a) The least amount of speed
   (b) The least amount of velocity
   (c) The least amount of acceleration
   (d) None of these

7. **A body of mass 0.4 kg spins in a vertical circle making 2 rev/s. If the radius of the circle is 1.2 m then _____ is 41.56 N.**
   (a) Tension in the string when the body is at the top of the circle
   (b) Tension in the string when the body is at the lowest point of the circle
   (c) Tension in the string when the body is in fixed position
   (d) None of these

8. **A cubic foot of natural gas gives off_____.**
   (a) 1000 Btu (b) 1500 Btu
   (c) 2000 Btu (d) 2500 Btu

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9. A child is swinging a swing. Least amount and maximum heights of swing from earth's surface are 0.75 m and 2m respectively. _____ of this swing is 5 m/s.
(a) The maximum velocity (b) The minimum velocity
(c) The average velocity (d) None of these

10. Equallzing pulses in TV are located throughout the_____.
(a) Vertical blanking period
(b) Straight blanking period
(c) Immediately blanking period
(d) None of these

11. The most helpful approach to radar system for monitoring the speed of affecting vehicles is_____.
(a) Simple radar (b) Complex radar
(c) Doppler radar (d) None of these

12. For _____, the skeleton that reaction results in a DC machine is neutralised by using compensating winding and commutating poles.
(a) Spark commutation (b) Damp commutation
(c) Bright commutation (d) None of these

13. If an input sign with non-zero DC constituent is applied to a low pass RC network, the DC constituent in the output will be _____ than that in the input.
(a) Lesser (b) Equal to
(c) More (d) None of these

14. _____ particles are supposed to outnumber any supplementary class of particles.
(a) Photons (b) Quarts
(c) Neutrons (d) Electrons

15. In Fractional horse power shaded-pole motors the direction of rotation is from _____portion of the poles.
(a) Unshaded to shaded (b) Shaded to unshaded
(c) Positive to negative (d) Negative to positive

16. Control rods used in unclear reactors are made with _____.
(a) Nitrogen (b) Boron
(c) Silver (d) None of these

17. Why is the centre in Newton's rings experiment sometimes bright?
(a) Because it is without any path difference so a bright fringe is obtained
(b) Because it is with path difference so a bright fringe is obtained
(c) Because it is without any path difference so a curve fringe is obtained
(d) Because it is without any path difference so a simple fringe is obtained

18. In Newton's ring experiment we can obtain bright centre by using _____.
(a) Plano concave lens (b) Plano convex lens
(c) Microscope (d) None of these

19. 'Big Bang' theory is all about_____
(a) The creation of the universe (b) The shape of the universe
(c) The end of the universe (d) None of these

20. _____ use laser lights while working.
(a) Physicians (b) Plumbers
(c) General practitioners (d) None of these

21. _____ is vital for a laser light.
(a) A medium (b) A vacuum
(c) A water (d) None of these

22. Galloping in transmission line conductors occurs usually due to asymmetrical layers of_____.
(a) Ice formation (b) Wind formation
(c) Weight formation (d) None of these

23. The _____of a short circuited line is -1.
(a) Reflection coefficient (b) Refraction coefficient
(c) Constant coefficient (d) None of these

24. The Big Bang experiment starts from France and_____.
(a) Switzerland (b) England
(c) Paris (d) None of these

25. The _____is utilised in the computation of the energy.
(a) Fine structure constant (b) Gravitational constant
(c) Planck's constant (d) Neutron

26. In the early 20th century, _____and his team of physicists revolutionised how scientists view the nature of the atom.
(a) Ernest Rutherford (b) Radovan
(c) Albert Einstein (d) None of these

27. _____ is the organisation responsible for conducting the Big Bang experiment.
(a) CERN (b) FIA
(c) SUPARCO (d) None of these

28. _____is carried out below the earth.
(a) LHC experiment (b) LHC experiment
(c) LWC experiment (d) None of these

29. A man weighing 600 N Collides against a box with a force of 20 N, but the box does not move. If the box weighs 3,000 N then the force which the box exerts on the man is _____.
(a) 15 N (b) 20 N
(c) 30 N (d) 50 N

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30. 300°C = _____ K
(a) 212 (b) 573
(c) 373 (d) None of these

31. An object weighing 40 N is dragged a distance of 20 metres by a force of 5 N in the direction of motion. The work done by the 5 N forces is _____.
(a) 10 J (b) 100 J
(c) 200 J (d) 500 J

32. A man grasps two hard steel objects above the floor whose weights are 10 N and 20 N. As evaluated with the potential energy of the 10 N objects, _____ is greater even if air is present.
(a) The potential energy of the 20 N object
(b) The kinetic energy of the 20 N object
(c) The potential energy of the 10 N object
(d) None of these

33. A motor works from a 120 V electrical source and uses 4 amperes of current. _____ is the power generated by the motor.
(a) 280 W (b) 380 W
(c) 480 W (d) 680 W

34. A stone is thrown upward from sea level to an altitude of 20 metres. Suppose that air resistance is minor then its acceleration is _____.
(a) Descending (b) Increasing
(c) Escalating (d) None of these

35. An object is positioned at 10 cm from a concave mirror whose radius of curvature is 12 cm. _____ is the distance of the image from the mirror.
(a) 5 cm (b) 15 cm
(c) 25 cm (d) 50 cm

36. Two conduction spheres are negatively charged. The distance between them is 20 cm. The force that these two spheres exert on each other is 4×10^{-4} N. If the distance between them is augmented to 40 cm, the electrostatic force between them becomes _____.
(a) 1×10^{-4} N (b) 2×10^{-4} N
(c) 3×10^{-4} N (d) 4×10^{-4} N

37. _____ do not represent electromagnetic waves.
(a) Alpha rays (b) Beta rays
(c) Gamma rays (d) None of these

38. _____ is utilised in a nuclear reactor to slow down neutrons.
(a) Alpha particles (b) Neutrons
(c) Graphite (d) Carbon

39. A gamma ray photon generates a collision with an electron at rest. During the process the change in the photon will be a decrease in _____.
(a) Momentum and potential energy
(b) Momentum and kinetic energy
(c) Force and kinetic energy
(d) None of these

40. If two sounds have the _____, the louder sound has the greater amplitude.
(a) Similar sound but different loudness
(b) Similar frequency but different loudness
(c) Similar pitch but different loudness
(d) None of these

41. Light can travel in vacuum, a distance of about _____.
(a) 200,000 km (b) 300,000 km
(c) 600,000 km (d) 800,000 km

42. Friction is a(an) _____ force in daily life.
(a) Natural force (b) Iniquity
(c) Important (d) None of these

43. Two astronauts have abandoned their spaceship in a section of space far from the gravitational attraction of any other body. Both have a mass of 100kg and are 100m apart. Both are primarily at rest as compared to one another. How long will it be before the gravitational attraction brings them 1cm closer to each other?
(a) 1.52 days (b) 1.41 days
(c) 1.70 days (d) 1.90 days

44. Two protons are equivalent to each other with equal speeds 9×10^5 m/s. The ratio of magnetic force and electrical force between them is _____.
(a) 6×10^6 (b) 9×10^6
(c) 12×10^6 (d) 15×10^6

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47. A mallet weighing 3kg is moving with a velocity of 10 m/s hits against the head of a spike and collides it into a block of wood. If the mallet comes to rest in 0.025s then the impulse related with the ball will be _____.
(a) 30 N (b) 20 N
(c) 40 N (d) 50 N

48. Bells are finished of metal and not of wood because wood _____ while metals are elastic.
(a) Creates vibrations (b) Dampens vibrations
(c) Generates vibrations (d) None of these

49. Two solid subjects of radii R_1 and R_2 are heated on identical temperature and permitted to cool under similar circumstances. Their rates of cooling are in the ratio of _____.
(a) R_1/R_2 (b) R_2/R_1
(c) $4R_2/2R_1$ (d) $3R_2/5R_1$

50. A sphere at temperature 600 K is placed in surroundings of temperature 200 K. Its cooling rate is H. If the warmth is reduced to 400 K then the cooling in same environment will be _____.
(a) 8H/6 (b) (29/8) H
(c) (18/13) H (d) (3/16) H

ANSWERS

1.	b	2.	a	3.	b	4.	a	5.	b
6.	a	7.	a	8.	a	9.	a	10.	a
11.	c	12.	a	13.	c	14.	c	15.	b
16.	b	17.	a	18.	a	19.	a	20.	b
21.	a	22.	a	23.	a	24.	a	25.	c
26.	a	27.	a	28.	a	29.	b	30.	b
31.	b	32.	a	33.	c	34.	d	35.	b
36.	a	37.	b	38.	c	39.	b	40.	c
41.	b	42.	c	43.	b	44.	b	45.	b
46.	b	47.	a	48.	b	49.	a	50.	d

SAMPLE PRACTICE TEST – 4

1. Which of the following is a vector quantity?
(a) Mass (b) Length
(c) Flux (d) Torque

2. The two non-zero vectors $\vec{a}$ and $\vec{b}$ are at right angle to each other if
(a) $\vec{a}.\vec{b} = 0$ (b) $\vec{a}.\vec{b} = 1$
(c) $\vec{a} \times \vec{b} = 0$ (d) $\vec{a}.\vec{b} = ab$

3. The unit of coefficient of viscosity is
(a) kg m/s (b) lb/ft.sec
(c) kg m^2/sec (d) kgm/sec^2

4. The digit 0.007310 has _____ significant figures.
(a) 3 (b) 7
(c) 4 (d) 6

5. SI unit of solid angle is
(a) Radian (b) Degree
(c) Steradian (d) Minute

6. Which of the following is true?
(a) $\hat{i} \times \hat{j} = \hat{k}$ (b) $\hat{i}.\hat{j} = 0$
(c) $\hat{j}.\hat{j} = 1$ (d) All of these

7. The mass of an object is a quantitative measure of its
(a) Weight (b) Inertia
(c) Acceleration (d) All of these

8. An object of mass 100 kg has its velocity reduced from 10 m/s to 5 m/s in 5 seconds
(a) 500 N (b) 2500 N
(c) 100 N (d) 50 N

9. The trajectory of the projectile is
(a) Hyperbolic (b) Parabolic
(c) Circular (d) Elliptical

10. The field in which the work done is independent of path followed and is zero in a closed path is called
(a) Gravitational field (b) Elastic field
(c) Conservative field (d) Closed field

11. kWh is a unit of
(a) Energy (b) Power
(c) Force (d) Voltage

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12. A 50 kg boy runs up a long flight of stairs in 5 sec. The vertical height of the stairs is 10 m. His power output is
(a) 980 W (b) 100 W
(c) 2500 W (d) 770 W

13. There is more energy reaching earth in ___ of sunlight than in all the fossil fuels on earth.
(a) 1 hr (b) 1 day
(c) 7 days (d) 10 days

14. A 200 kg vehicle is turning round a corner of arc radius 10m at 10 m/s. The force that must be exerted by the pavement on the tyres to hold the vehicle in the circular path is
(a) 1×10^5 N (b) 2×10^4 N
(c) 2000 N (d) 10,000 N

15. A disc without slipping rolls down a hill of height 30 m. If the disc starts from rest at the top of the hill, what is its speed at the bottom? Take value of 'g' equal to 10 m/s^2.
(a) 20 m/s (b) 0
(c) 15 m/s (d) 30 m/s

16. The drag force on a sphere moving slowly through a fluid is given by
(a) Newton's law (b) Stoke's law
(c) Hooke's law (d) Ampere's law

17. The irregular flow of the fluid is called
(a) Turbulent flow (b) Laminar flow
(c) Streamline flow (d) Ideal flow

18. The product of cross sectional area of the pipe and the fluid speed at any point along the pipe is equal to ___ of the fluid.
(a) Volume (b) Mass flow rate
(c) Volumetric flow rate (d) Density

19. The acceleration at any instant of a body executing SIIM is proportional to the displacement and is always directed ___ its mean position.
(a) Towards (b) Away from
(c) At right angle to (d) None of these

20. What is the frequency of a simple pendulum whose period is 1s at a place where the acceleration due to gravity is 9 m/s^2?
(a) 9 Hz (b) 3 Hz
(c) 1 Hz (d) 0.7 Hz

21. The waves in which the medium of the particles vibrate in a direction right angle to the direction of propagation of waves, are called
(a) Longitudinal waves (b) Transverse waves
(c) Compresional waves (d) Stationary waves

22. The speed of sound at S.T.P is
(a) 3×10^8 m/s (b) 332 m/s
(c) 3×10^5 m/s (d) 3 m/s

23. The condition for destructive interference is given by
(a) $\Delta X = n\lambda$ (b) $\Delta S = \frac{n\lambda}{2}$
(c) $(n+1)\frac{\lambda}{2}$ (d) $\Delta S = (2n+1)\frac{\lambda}{2}$

24. A pipe has a length of 1m. If the pipe is closed at one end and speed of sound is 336 m/s then its fundamental frequency is
(a) 84 Hz (b) 168 Hz
(c) 336 Hz (d) 672 Hz

25. The distance between two adjacent bright or dark fringes is given by
(a) $\Delta y = \frac{2L\lambda}{d}$ (b) $\Delta y = \frac{L\lambda}{d}$
(c) $\Delta y = 2d \sin\theta$ (d) $\Delta y = mL\frac{\lambda}{2}$

26. The property of bending of light around obstacles and spreading of light waves into the geometrical shadow of an obstacle is called
(a) Diffraction (b) Polarization
(c) Reflection (d) Refraction

27. The value of least distance of district vision is equal to
(a) 5 cm (b) 15 cm
(c) 25 cm (d) 35 cm

28. The ratio of the angles subtended by the image as seen through the optical device to that subtended by the object at the unaided eye is called
(a) Solid angle (b) Angular magnification
(c) Least distance of distinct vision
(d) None of these

29. The value of the speed of light is
(a) 3×10^8 m/s (b) 332 m/s
(c) 1×10^6 m/s (d) 9×10^{16} m/s

30. According to first law of thermodynamics which of the following is true
(a) $Q^2 = W - \Delta u$ (b) $\Delta u^2 = Q + W$
(c) $\Delta W = Q^2 - u^2$ (d) $Q = \Delta u + W$

31. The value of permittivity for free space is
(a) 8.85×10^{-12} $C^2N^{-1}m^{-2}$ (b) 9×10^9 $C^2N^{-1}m^{-2}$
(c) 3×10^8 $C^2N^{-1}m^{-2}$ (d) 6.63×10^{-34} $C^2N^{-1}m^{-2}$

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32. The SI unit of electric flux is
(a) NC^{-1} (b) NmC^{-1}
(c) $Nm^{-2}C^{-2}$ (d) Nm^2C^{-1}

33. A particle carrying a charge of 3e falls through a potential difference of 5V. The energy acquired by it is
(a) 45 eV (b) 15 eV
(c) 0.8 eV (d) 1.3 eV

34. 10,000 electrons pass through a conductor in 1×10^{-9} sec. The current following through the conductor is
(a) 1.6×10^{-6} Amp (b) 1.6×10^{3} Amp
(c) 1.6 mA (d) 1.6×10^{-19} A

35. Which of the following is a temperature measuring device?
(a) Thermometer (b) Thermister
(c) Thermocouple (d) All of these

36. Which of the following has a negative temperature coefficient?
(a) Iron (b) Steel
(c) Silicon (d) All of these

37. A 20cm wire carrying a current of 20A is placed in a uniform magnetic field of 0.5 T. If the wire is held at right angle to the direction of magnetic field then the magnitude of the force acting on the wire is
(a) 0 (b) 2 N
(c) 5 N (d) 0.5 N

38. The magnetic field in a certain region is given by $\vec{B}=(4\hat{i}+5\hat{k})$ wbm^{-2}. The flux passing through a $7cm^2$ area loop in this region if it lies flat in the xy-plane is
(a) 35 Wb (b) 3.5 Wb
(c) 0.35 Wb (d) 0.0035 Wb

39. Galvanometer is used to
(a) Measure current (b) Measure resistance
(c) Measure voltage (d) Detect current

40. According to Lenz's law the direction of the induced current is always so as to _____the change which causes the current.
(a) Cancel (b) Oppose
(c) Support (d) Increase

41. The phenomenon in which a changing current in one coil induces on emf in another coil is called
(a) Mutual induction (b) Motional emf
(c) Self induction (d) Binary induction

42. When 100 V are applied to an A.C. circuit, the current flowing in it is 0.1 A. Its impedance is
(a) 10 Ω (b) 100 Ω
(c) 1000 Ω (d) 10,000 Ω

43. The resonance frequency of parallel resonant circuits is given by the relation
(a) $f_r=\frac{1}{2\pi\sqrt{LC}}$ (b) $f_r=2\pi\sqrt{LC}$
(c) $f_r=\sqrt{LC}$ (d) $f_r=\frac{1}{\sqrt{LC}}$

44. The process of combining a low frequency signal to a high frequency radio wave is called
(a) Resonance (b) Transposition
(c) Modulation (d) Emulsion

45. The force per unit area that causes the change in shape of a body is called
(a) Strain (b) Longitudinal stress
(c) Shear Stress (d) Young's Modulus

46. The doping ratio for a semi-conductor is usually
(a) 1:2 (b) 1:10
(c) 1:3000 (d) $1:10^6$

47. The curie temperature of iron is
(a) 79 °C (b) 320 °C
(c) 750 °C (d) 1125 °C

48. Photodiode is used for
(a) Detection of light (b) Measurement of light intensity
(c) Production of light (d) Production of electrical energy

49. The mathematic notation for OR gate is
(a) X = A+B (b) X = A.B
(c) $X=\overline{A+B}$ (d) $X=\overline{A.B}$

50. Special theory of relativity was presented by
(a) Newton (b) Einstein
(c) Max Planck (d) J.J. Thomson

51. Dr. Abdus Salam was awarded Nobel prize in
(a) 1959 (b) 1969
(c) 1979 (d) 1989

52. According to special theory of relativity if an object is moving with the velocity of light, its mass
(a) Doest not change (b) Decreases
(c) Becomes zero (d) Becomes infinite

53. The value of Planck's constant is
(a) 1.6×10^{-19} JS (b) 3×10^{3} JS
(c) 6.63×10^{-34} JS (d) 9×10^{9} JS

54. Photoelectric effect proves the _____ nature of light.
(a) Wave (b) Particle

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(d) Radioactive

55. Minimum amount of energy that a photon must have to produce pair production is
(a) 0.51 MeV (b) 1.02 MeV
(c) 9.35 MeV (d) 28 MeV

56. Atomic spectrum is the example of
(a) Continuous spectrum (b) Line spectrum
(c) Band spectrum (d) None of these

57. In unified mass scale, the mass of the proton is
(a) 0.000554 (b) 1.0086654
(c) 1.007276 u (d) 1.67×10^{-27} u

58. Hydrogen has _____isotopes.
(a) 2 (b) 3
(c) 4 (d) 5

59. Radioactivity was discovered by
(a) Henri Becquerel (b) Marie Curie
(c) Rutherford (d) Chadwick

60. Such a reaction in which a heavy nucleus splits up into two nuclei of equal size along with the emission of energy during the reaction is called
(a) Fission (b) Fusion
(c) Modulation (d) Amplification

ANSWERS

1.	d	2.	a	3.	b	4.	c	5.	c
6.	d	7.	b	8.	c	9.	b	10.	c
11.	a	12.	a	13.	d	14.	b	15.	a
16.	b	17.	a	18.	c	19.	a	20.	c
21.	b	22.	b	23.	d	24.	a	25.	b
26.	a	27.	c	28.	b	29.	a	30.	d
31.	a	32.	d	33.	b	34.	a	35.	d
36.	c	37.	b	38.	d	39.	d	40.	b
41.	a	42.	c	43.	a	44.	c	45.	c
46.	d	47.	c	48.	a	49.	a	50.	b
51.	c	52.	d	53.	c	54.	b	55.	b
56.	b	57.	c	58.	b	59.	a	60.	a

SAMPLE PRACTICE TEST – 5

1. **0.000467 has _____ significant figures.**
(a) 3 (b) 4
(c) 2 (d) 5

2. **One Pascal is equal to**
(a) $kg\ m\ s^{-2}$ (b) $kg\ m^{-1}\ s^{-2}$
(c) $kg\ m^{2}\ s^{-3}$ (d) $kg\ m^{2}\ s^{-2}$

3. **The SI unit for amount of a substance is**
(a) Candela (b) Kilogram
(c) Gram (d) Mole

4. **What are the dimensions of gravitational constant G?**
(a) $M^{-2}L^{2}T^{3}$ (b) $M^{-1}L^{3}T^{4}$
(c) $M^{-1}L^{3}T^{-2}$ (d) $M^{-1}L^{-3}T^{2}$

5. **Two forces of magnitude 10 N and 20 N acting on a body in directions making angle 30° and 60° with x-axis respectively. Then the reluctant force is**
(a) 30 N (b) 29 N
(c) 31 N (d) 28 N

6. **A.B = B., in other words it shows that scalar product is**
(a) Additive (b) Subtractive
(c) Commutative (d) Cumulative

7. **The SI unit of torque is**
(a) Nm^{-1} (b) Nm^{-2}
(c) Nm^{-3} (d) Nm

8. **$v_t^2 = v_i^2 + 2as$ is called the _____equation of motion.**
(a) 1st (b) 2nd
(c) 3rd (d) None of these

9. **If two masses m_1 and m_2 are initially at rest with a spring compressed between them. The ratio of their velocities after the spring has been released is**
(a) $10\ ms^{-1}$ (b) $20\ ms^{-1}$
(c) 10 kg m/s (d) $\frac{N_1}{v_2} = \frac{m_2}{m_1}$

10. **If $\theta = 90°$ then the amount of work done is**
(a) 90 N (b) 1 N
(c) 10 N (d) None of these

11. **Work done in the earth's gravitational field is _____of the path followed.**
(a) Independent (b) Dependent

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(c) Semi-independent (d) Semi-dependent

12. Solar energy at normal incidence outside the earth's atmosphere is about
(a) $1\ kWm^{-2}$ (b) $4\ kWm^{-2}$
(c) $1.4\ kWm^{-2}$ (d) $1.6\ kWm^{-2}$

13. If a 1000 Kg car is turning round corner at $10ms^{-1}$ as it travels on along an arc of a circle. If the radius of the circular path is 10m, the then force must be exerted by the pavement on the tyres to keep the car in the circular path is
(a) 10×10^3 N (b) 1.0×10^5 N
(c) 1.0×10^6 N (d) 1.0×10^4 N

14. 1 rad is equal to
(a) 5.73° (b) 57.3°
(c) $\frac{360^\circ}{2\pi}$ (d) Both b and c

15. In circular motion direction of motion
(a) Changes continuously
(b) Constant
(c) Semi constant
(d) Not perfect

16. Stoke's law is given as
(a) $F = 6\pi\eta rv$ (b) $F = 8\pi\eta rv$
(c) $F = 2\pi\eta rv$ (d) Both b and c

17. Blood pressure is measured by
(a) Sphenometel (b) Sphygmomanometer
(c) Manometer (d) Barometer

18. Thick tar and honey have _____ coefficient of viscosities.
(a) Normal (b) Large
(c) Very short (d) Infinite

19. In simple pendulum T =
(a) $\frac{1}{2\pi}\sqrt{\frac{\ell}{g}}$ (b) $2\pi\sqrt{\frac{\ell}{g}}$
(c) $2\pi\sqrt{\frac{g}{\ell}}$ (d) $4\pi\sqrt{\frac{g}{\ell}}$

20. Waves transport
(a) Matter (b) Particles
(c) Energy (d) Momentum

21. Doppler effect is seen in
(a) Sound waves (b) Light waves
(c) Both a and b (d) None of these

22. The ranges of hearing for human is
(a) 1000—120,000 (b) 20—20,000
(c) 200—20,000 (d) 15—50,000

23. Bending of light around obstacles is due to _____ of light.
(a) Diffraction (b) Reflection
(c) Rarefaction (d) Polarization

24. For diffraction of x-rays by crystals _____ relation is used.
(a) $d \sin\theta = n\lambda$ (b) $l = m\frac{\lambda}{2}$
(c) $2d \sin\theta = n\lambda$ (d) $d \sin\theta = (m + \frac{1}{2})^2$

25. Yellow sodium light of wavelength 589 nm, emitted by a single source passes through two narrow slits 1.00 mm apart. The interference pattern is observed on a screen 225 cm away. The two adjacent bright fringes are ___far apart.
(a) 1.33×10^{-3} m (b) 1.33 mm
(c) Both a and b (d) 10.5 m

26. _____ is an optical device used to study spectra from different sources of light.
(a) Spectrometer (b) Convex lens
(c) Prism (d) Microscope

27. The least distance of distinct vision is about _____ from the eye.
(a) 250 cm (b) 25 m
(c) 2 cm (d) 25 cm

28. The final image seen in the astronomical telescope is
(a) Virtual, enlarge & inverted (b) Real, small, erect
(c) Virtual, enlarge & erect (d) None of the above

29. _____ process is the process in which Boyle's law holds good.
(a) Adiabatic (b) Isothermal
(c) Isobaric (d) Isochoric

30. The size of the molecule is much smaller than the _____ between molecules.
(a) Length (b) Diameter
(c) Cross-sectional area (d) Separation

31. The turbine in a steam power plant takes steam from a boiler at 427°C and exhausts into a low temperature reservoir at 77°C. The maximum possible efficiency is
(a) 50% (b) 5%
(c) 15% (d) 10%

32. The electric intensity between two oppositely charged parallel plates is
(a) $E = \frac{2\sigma}{E_o}$ (b) $E = \frac{e}{2E_o}$

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(c) $H = \frac{\sigma}{B_o}$ (d) $B = \frac{\sigma}{B_o}$

33. The capacitance of a capacitor depends on the
(a) Q (b) V
(c) P (d) Both a and b

34. In Wheatstone bridge _____resistances are used.
(a) Two (b) Four
(c) Three (d) One only

35. It is necessary that the resistance of the voltmeter should be ___than the resistance of the circuit to which it is connected.
(a) Less (b) More
(c) Can be both a & b (d) None of these

36. An ideal voltmeter have _____resistance.
(a) More (b) Less
(c) Finite (d) Infinite

37. Force on a current carrying conductor in a uniform magnetic field is given as
(a) $F = LB \sin \alpha$ (b) ILB Sin α
(c) $F = ILB \cos \alpha$ (d) $F = ILB \tan \alpha$

38. The strength of magnetic field is also known as
(a) Magnetic pole (b) Magnetic induction
(c) Magnetic field (d) None of these

39. Magnetic flux is, through plane element of area A in a uniform magnetic field B is given as
(a) $\overline{\Phi_B} = \overline{B} \times \overline{A}$ (b) $\Phi_B = B.A$
(c) $BA \sin 0 = \Phi_B$ (d) None of these

40. _____discovered that electric currents produce magnetic fields.
(a) Newton (b) Faraday
(c) de Broglie (d) Oersted

41. A metal rod of length 25 cm is moving at a speed of 0.5 ms^{-1} in a direction perpendicular to a 0.25 T magnetic field, the emf produced in the rod is
(a) 3.13×10^{-2} V (b) 5.15×10^{-2} V
(c) 4.14×10^{-2} V (d) 6.16×10^{-2} V

42. Generator is a device that converts
(a) Chemical energy into electrical energy
(b) Mechanical energy into electrical energy
(c) Solar energy into electrical energy
(d) Hydel energy into electrical energy

43. Angular frequency is given as
(a) $W = 2\pi f$ (b) $W = 2\pi T$
(c) $W = \frac{2\pi}{\lambda}$ (d) None of these

44. The reactance of the capacitor of 100 μF is connected to an alternating voltage of 24V and frequency 50 Hz is
(a) 31.8 Ω (b) 34.8 Ω
(c) 35 Ω (d) 40 Ω

45. At what frequency will an inductor of 1.0 H have a reactance of 500 Ω.
(a) 60 Hz (b) 80 Hz
(c) 100 Hz (d) 120 Hz

46. The resonance frequency is given as
(a) $f_r = \frac{1}{\pi\sqrt{LC}}$ (b) $f_r = \frac{1}{2\pi\sqrt{LC}}$
(c) $f_r = \frac{1}{3\pi\sqrt{LC}}$ (d) $f_r = \frac{1}{4\pi\sqrt{LC}}$

47. The capacitance required to construct a resonance circuit of frequency 1000 kHz with an inductor of 5m H is
(a) 5.09 pF (b) 5.09 F
(c) 5.09 uF (d) 5.09 nF

48. The SI unit of stress is
(a) N (b) Nm^{-1}
(c) Nm^{-3} (d) Pa

49. In majority of electronic circuits, transistor are basically used as
(a) Amplifier (b) Voltage accelerator
(c) Generator (d) Both a and b

50. In p-n-p transistor _____region is known as base.
(a) Side (b) Corner
(c) Central (d) Both

51. There are _____types of rectification.
(a) Three (b) Two
(c) One (d) Five

52. P-n junction is also known as
(a) Semi-conductor diode (b) Photodiode
(c) Light emitting diode (d) photovoltaic cell

53. At about 1600°C, the platinum wire colour is about
(a) Orange (b) Red
(c) Cherry red (d) White

54. For pair production _____ amount of energy is required.
(a) 0.511 MeV (b) 1.02 MeV

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(d) 5 MeV

(c) 1 MeV

55. The energy of a photon in a beam of infrared radiation of wavelength 1240 nm is
(a) 1.0 eV (b) 1.6×10^{-19} j
(c) Both a and b (d) 1×10^{10} eV

56. The process similar to x-rays production is
(a) Compton effect (b) Pair production
(c) Photoelectric effect (d) Annihilation of matter

57. The branch of physics that deals with the investigation of wavelength and intensities of electromagnetic radiation emitted or absorbed by atoms is called as
(a) Astrology (b) Atomic physics
(c) Spectroscopy (d) Nuclear physics

58. The value of Rydberg constant is
(a) $1.0974 \times 10^{7}\ m^{-1}$ (b) $1.0974 \times 10^{8}\ m^{-1}$
(c) $1.0974 \times 10^{9}\ m^{-1}$ (d) $1.0974 \times 10^{10}\ m^{-1}$

59. Radioactivity was discovered by
(a) Marie Curie (b) Pierre Curie
(c) Both a and b (d) Henri Becquerel in 1896

60. The amount of energy which is absorbed by a man of 80 kg who receives a lethal whole body equivalent dose of 400 rem in the form of low energy neutrons for which RBE factor is 10 is about
(a) 30 J (b) 32 J
(c) 40 J (d) 32 KJ

ANSWERS

1.	a	2.	b	3.	d	4.	c	5.	b
6.	c	7.	d	8.	c	9.	d	10.	d
11.	a	12.	c	13.	d	14.	d	15.	a
16.	a	17.	b	18.	b	19.	b	20.	c
21.	b	22.	b	23.	a	24.	c	25.	c
26.	a	27.	d	28.	a	29.	b	30.	d
31.	a	32.	c	33.	d	34.	b	35.	b
36.	d	37.	b	38.	b	39.	b	40.	d
41.	a	42.	b	43.	a	44.	a	45.	b
46.	b	47.	a	48.	d	49.	a	50.	c
51.	b	52.	a	53.	d	54.	b	55.	c
56.	c	57.	c	58.	a	59.	d	60.	b

SAMPLE PRACTICE TEST – 6

1. The dimensions of viscosity is
(a) $ML^{-1}T^{-1}$ (b) MLT^{-1}
(c) $ML^{2}T^{-2}$ (d) $ML^{2}T^{-1}$

2. 0.0720 has _____significant figures.
(a) 2 (b) 3
(c) 4 (d) 5

3. The SI unit of solid angle is
(a) Radian (b) Steradian
(c) Degree (d) Minute

4. Which of the following is not a vector quantity?
(a) Work (b) Torque
(c) Momentum (d) Angular velocity

5. A force $\vec{F} = 2\hat{i} + \hat{j}$, has its point of application moved from a point (1,3) to the point (2,5). The work done by the force is
(a) 4 J (b) 16 J
(c) 13 J (d) 7 J

6. The two vectors to be combined have magnitudes 65 N and 30 N. Which of the following magnitudes, the resultant may have?
(a) 100 N (b) 125 N
(c) 85 N (d) 15 N

7. The area between the velocity-time graph and the time axis is numerically equal to
(a) Distance (b) Velocity
(c) Acceleration (d) Time

8. Which of the following is true for elastic collision of two bodies?
(a) Mass is conserved (b) Momentum is conserved
(c) K.E. is conserved (d) All of the above

9. The range of the projectile is maximum for
(a) $\theta = 30°$ (b) $\theta = 45°$
(c) $\theta = 60°$ (d) $\theta = 90°$

10. What is meant by ballistic trajectory?
(a) The path followed by an unpowered and unguided projectile
(b) The path followed by powered and unguided projectile
(c) The path followed by unpowered but guided projectile
(d) The path followed by powered and guided projectile

11. In a conservative field work done in a closed path is
(a) Positive (b) Negative
(c) Zero (d) Infinite

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12. 1 h.p. is equal to
(a) 550 kW (b) 746 kW
(c) 0.746 kW (d) 3.6 kW

13. The value of escape velocity is approximately equal to
(a) 3.1 kms^{-1} (b) 1.1 kms^{-1}
(c) 0.011 kms^{-1} (d) 11 kms^{-1}

14. A water hose with an internal Cross-sectional area of $2.5\times10^{-4}\ m^2$ at the outlet discharges water at the mass flow rate of 0.5 kg S^{-1}. The water speed at the outlet is
(a) 1.5 ms^{-1} (b) 2 ms^{-1}
(c) 2.5 ms^{-1} (d) 250 ms^{-1}

15. With usual notations, the mathematical form of the Torricelli's theorem is
(a) $v_2 = 2g\sqrt{h_2 - h_1}$ (b) $v_2 = 2\pi g\sqrt{h_2 - h_1}$
(c) $v_2 = 2\pi(h_2 - h_1)\sqrt{2g}$ (d) $v_2 = \sqrt{2g(h_2 - h_1)}$

16. The time period of a second pendulum is
(a) 0.5 s (b) 1 s
(c) 2 s (d) 2.5 s

17. A physical system under going forced vibrations is known as
(a) Simple harmonic oscillator (b) Driven harmonic oscillator
(c) Damped harmonic oscillator (d) Undamped harmonic oscillator

18. 1 rad is equal to
(a) 27° (b) 40.7°
(c) 57.3° (d) 62.3°

19. The force that is required by an object to move in a circular path is called
(a) Centripetal force (b) Centrifugal force
(c) Short range force (d) Gravitational force

20. The mass of the earth is
(a) 3×10^8 kg (b) 6×10^6 kg
(c) 6×10^{11} kg (d) 6×10^{24} kg

21. The minimum velocity required to put a satellite into the orbit is
(a) 11 kms^{-1} (b) 3×10^5 kms^{-1}
(c) 7.9 kms^{-1} (d) 4.3 kms^{-1}

22. The orbital radius measured from the centre of the earth for a geostationary satellite is equal to
(a) 6.4×10^5 km (b) 6.4×10^3 km
(c) 4.23×10^4 km (d) 27.9 km

23. The terminal velocity of a small droplet moving through a fluid is given by the relation
(a) $v_t = 6\pi\eta rv$ (b) $v_t = \frac{m}{6\pi\eta rv}$

(c) $v_t = \frac{4}{3}\pi r^3$ (d) $v_t = \frac{2gr^2\rho}{9\eta}$

24. Which of the following is true for an ideal fluid?
(a) It is non-viscous. (b) It is incompressible.
(c) Its flow is laminar. (d) All of these

25. Damping is a process whereby energy is _____the oscillating system.
(a) Added to (b) Dissipated from
(c) Conserved in (d) None of these

26. The waves in which the particles of the medium vibrate in the direction of propagation of waves are called
(a) Sound waves (b) Transverse waves
(c) Longitudinal waves (d) Compressional waves

27. The speed of sound in air at S.T.P. is
(a) 332 ms^{-1} (b) 3.32 ms^{-1}
(c) 3×10^8 ms^{-1} (d) 9.1 ms^{-1}

28. A turning fork A produces 4 beats per second with another tunning fork B. It is found that by loading B with some wax, the beat frequency increases to 6 beat per second. If the frequency of A is 320 Hz, then the frequency of B when loaded is
(a) 316 Hz (b) 324 Hz
(c) 326 Hz (d) 314 Hz

29. The variation in the frequency of the sound due to the relative movement of the observer and source of sound is called
(a) Nowton's effect (b) Doppler effect
(c) Compton effect (d) Bernoulli's effect

30. A pipe has a length of 1m. If the pipe is open at both ends then its second harmonic is
(a) 510 Hz (b) 85 Hz
(c) 425 Hz (d) 170 Hz

31. The property of bending of light around obstacles and spreading of light waves into the geometrical shadow of an obstacle is called
(a) Polarization (b) Diffraction
(c) Reflection (d) Refraction

32. A typical diffraction grating has about __ lines per centimeter.
(a) 100-200 (b) 200-2000
(c) 400-5000 (d) 5000-10,000

33. The distance between two adjacent bright or dark fringes is given by
(a) $\Delta y = \frac{Ld}{d}$ (b) $\Delta y = 2d\sin\theta$
(c) $\Delta y = \frac{2L}{m}$ (d) $\Delta y = \frac{2d\sin\theta}{m\lambda}$

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34. The ratio of the size of the image to the size of the object is called
(a) Polarization (b) Diffraction grating
(c) Magnization (d) Solid angle

35. The sum of all forms of molecular energies of a substance is termed as its
(a) Intermolecular energy (b) Intramolecular energy
(c) Bond energy (d) Internal energy

36. A gas is enclosed in a container fitted with a piston of cross-sectional area $0.1m^2$. The pressure of the gas is maintained at $8000\ Nm^{-2}$. When heat is slowly transferred, the piston is pushed up through a distance of 4.0 cm. If 42J heat is transferred to the system during the expansion, then the change in internal energy of the system is
(a) 32 J (b) 10 J
(c) 22 J (d) 0

37. The turbine in a steam power plant takes steam from a boiler at 700 K and exhausts into a low temperature reservoir at 350 K. Its maximum possible efficiency is
(a) 10% (b) 50%
(c) 75% (d) 100%

38. The Coulomb's law is given by the equation
(a) $F = 6\pi\eta rv$ (b) $F = \frac{Gm_1m_2}{r^2}$
(c) $F = \frac{Kq_1q_2}{r^2}$ (d) $F = qE$

39. The flux through any closed surface is 1/Eo times the total charge enclosed in it. This is known as
(a) Ampere's law (b) Newton's law
(c) Coulomb's law (d) Gauss's law

40. The opposite point charges each of magnitude 'q' are separated by a distance 2d. The electric potential at a point midway between them is
(a) 0 (b) 1V
(c) 2V (d) 5V

41. 1 eV = _____J.
(a) 1.6×10^{23} (b) 1.6×10^{-19}
(c) 9.11×10^{-31} (d) 1.6×10^{-27}

42. Ohm's law states that
(a) V = IR (b) P = I2R
(c) F = qE (d) All of these

43. The reciprocal of the resistivity is called
(a) Conductance (b) Impedance
(c) Conductivity (d) Resistance

44. According to Kirchhoff's 1st rule
(a) $\Sigma R = 0$ (b) $\Sigma I = 0$
(c) $\Sigma V = 0$ (d) All of these

45. The CRO is used to display waveform of
(a) Voltage (b) Current
(c) Resistance (d) Impedance

46. The Galvanometer is used to detect
(a) Current (b) Voltage
(c) Resistance (d) All of these

47. The mathematical expression for the Faraday's law of electromagnetic induction is
(a) $\varepsilon = -N\frac{\Delta\phi}{\Delta t}$ (b) $\varepsilon = N\frac{\Delta I}{\Delta t}$
(c) $\varepsilon = -N^2\frac{R}{t}$ (d) $\varepsilon = NR\Delta I$

48. The phenomenon in which a changing current in a coil induces an emf in itself is called
(a) Motional emf (b) Self induction
(c) Mutual induction (d) Lenz's law

49. A 100 μF capacitor is connected to an A.C. voltage of 24 V. If the reactance of capacitor is 48 Ω, then the current in the circuit is
(a) 0.5 A (b) 0.75 A
(c) 1A (d) 2A

50. The process of combining the low frequency signal with a high frequency radio-wave is called
(a) Impedance (b) Polarization
(c) Modulation (d) Diffraction

51. The force per unit area that can deform the dimensions of an object is called
(a) Impulse (b) Strain
(c) Stress (d) Moment of inertia

52. A semiconductor in its extremely pure form is called semiconductor
(a) Intrinsic (b) Extrinsic
(c) Ideal (d) Super

53. The curie temperature of iron is
(a) 550°C (b) 750°C
(c) 870°C (d) 1125°C

54. A system that deals with quantities of variables which have only two discrete value or states is known as
(a) Electrical system (b) Analogue system
(c) Digital system (d) Isolated system

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55. The mathematical notation of NAND gate is
(a) $X = A + B$ (b) $X = A.B$
(c) $X = \overline{A.B}$ (d) $X = \overline{A + B}$

56. Thermistor is a sensor for
(a) Temperature (b) Light
(c) Pressure (d) Level

57. Max Planck received Nobel Prize in Physics in _____ for his discovery of energy quanta.
(a) 1905 (b) 1918
(c) 1927 (d) 1938

58. The uncertainty principle was given by
(a) Heisenberg (b) Compton
(c) Einstein (d) de Broglie

59. The energy of the first Bohr orbit of hydrogen atom is
(a) -1.36 eV (b) -11.3 eV
(c) -21.4 eV (d) -13.6 eV

60. Energy released per fission of one uranium nucleus is equal to
(a) 9.35 MeV (b) 28 MeV
(c) 0.9 MeV (d) 211.5 MeV

ANSWERS

1.	a	2.	b	3.	b	4.	a	5.	a
6.	c	7.	a	8.	d	9.	b	10.	a
11.	c	12.	c	13.	d	14.	b	15.	d
16.	c	17.	b	18.	c	19.	a	20.	d
21.	c	22.	c	23.	d	24.	d	25.	d
26.	c	27.	a	28.	d	29.	b	30.	a
31.	b	32.	c	33.	a	34.	c	35.	d
36.	b	37.	b	38.	c	39.	d	40.	a
41.	b	42.	c	43.	c	44.	b	45.	a
46.	a	47.	a	48.	b	49.	a	50.	c
51.	c	52.	a	53.	b	54.	c	55.	c
56.	a	57.	b	58.	a	59.	d	60.	d

SAMPLE PRACTICE TEST – 7

1. Hygrometer is used for measuring _____
(a) Speed of sound (b) Density of milk
(c) Humidity of air (d) None of these

2. Which of the following roofs provides better protection against heat?
(a) Reinforced concrete (b) Asbestos sheets
(c) Cement slab (d) None of these

3. Radioactivity was discovered by_____.
(a) Henry Bacquerel (b) Marie Curie
(c) Newton (d) Einstein

4. Sun derives its energy from the process of_____.
(a) Nuclear fission (b) Photosynthesis
(c) Nuclear fusion (d) Helium explosion

5. Both Centigrade and Fahrenheit scales show same reading at _____.
(a) 40° (b) -40°
(c) 100° (d) -273°

6. Anode is_____.
(a) Positive electrode (b) Negative electrode
(c) Neutral electrode (d) None of these

7. Total internal reflection occurs when light travels from_____.
(a) A rarer medium to a denser medium.
(b) A denser medium a to rarer medium
(c) Both of these
(d) None of these

8. Heat from the sun is received by earth by_____.
(a) Conduction (b) Convection
(c) Radiation (d) None of these

9. The instrument used for recording earthquakes is called _____.
(a) Cresograph (b) Lactometer
(c) Seismograph (d) Hydrometer

10. Mercury thermometer was invented by_____.
(a) Galileo (b) Fahrenheit
(c) Newton (d) Priestly

11. Unit of current is_____.
(a) Ampere (b) Ohm (Ω)
(c) Volt (d) Hertz

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12. What are the primary colours?
(a) Blue, green, yellow (b) Yellow, red, blue
(c) Red, blue, green (d) Green, white, black

13. Electric bulb was invented by_____.
(a) Newton (b) Faraday
(c) Edison (d) Graham Bell

14. Solar ultraviolet radiation is absorbed by_____.
(a) Exosphere (b) Ionosphere
(c) Ozonosphere (d) Stratosphere

15. Theodolite is an instrument used by_____.
(a) Navigators (b) Cartographers
(c) Surveyors (d) Pilots

16. The common gas used in refrigerators is _____.
(a) Neon (b) Alcohol
(c) Freon or Ammonia (d) None of these

17. Cylindrical glasses are advised to a patient suffering from _____.
(a) Hypermetropia (b) Myopia
(c) Astigmatism (d) night blindness

18. What is the fourth state of matter?
(a) Liquid (b) Plasma
(c) Gaseous (d) Solids

19. Which of the following is the best conductor of electricity?
(a) Aluminium (b) Copper
(c) Gold (d) Silver

20. Rectifiers are used to convert _____.
(a) DC to AC (b) AC to DC
(c) High voltage to low voltage (d) Low voltage to high voltage

21. A sudden fall in the barometric reading indicates_____.
(a) Extreme cold (b) Fine weather
(c) Rain (d) Storm

22. Atmospheric pressure is measured by_____.
(a) Hydrometer (b) Barometer
(c) Hygrometer (d) Lactometer

23. SONAR works on the principle of_____.
(a) Reflection of sound (b) Absorption of sound
(c) Reflection of radiowaves (d) None of these

24. The unit for measuring intensity of noise is_____.
(a) Calorie (b) Knot
(c) Ohm (d) Decibel

25. Flying balloons are filled with _____.
(a) Nitrogen (b) Hydrogen
(c) Oxygen (d) Carbon dioxide

(c) Measuring pollution in air and water
(d) Measuring temperature

13. Electric power is measured by_____.
(a) Voltmeter (b) Dynamometer
(c) Electrometer (d) None of these

14. ECG is an instrument used for the disorder of_____.
(a) Heart (b) Kidney
(c) Brain (d) Liver

15. Which instrument is used to measure time?
(a) Telemeter (b) Ionometer
(c) Sundial (d) Galvanometer

16. The energy of food is measured in_____.
(a) Kelvin (b) Bushel
(c) Calories (d) None of these

17. The telescope is used for viewing_____.
(a) Distant objects (b) Near objects
(c) Small objects (d) Living cells

18. Density of milk is measured by_____.
(a) Lactometer (b) Hydrometer
(c) Barometer (d) Hygrometer

19. Decibel is the unit of_____.
(a) Sound (b) Light
(c) Heat (d) Electricity

20. The instrument used to measure electric resistance is_____.
(a) Ohmmeter (b) Galvanometer
(c) Electrometer (d) Spectrometer

21. Richter scale is used for measuring_____.
(a) Density of liquid (b) Intensity of earthquake
(c) Velocity of wind (d) Humidity of air

22. Bolometer is used to measure_____.
(a) Radiant energy (b) Purity of milk
(c) Specific gravity (d) None of these

23. Centrifuge is an instrument used _____.
(a) To separate liquids
(b) To separate solids
(c) To separate mixtures of chemicals
(d) None of these

24. The instrument used to measure minute electric currents is _____.
(a) Electrometer (b) Ionometer
(c) Electric meter (d) Galvanometer

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25. The apparatus used in submarines to give a clear view of the object on the surface of the ocean is_____.
(a) Perimeter (b) Periscope
(c) Sextant (d) Telescope

26. Fathometer is used to measure_____.
(a) Earthquakes (b) Ocean depth
(c) Rainfall (d) Telescope

27. Which instrument is used to measure pressure?
(a) Saccharimeter (b) Ammeter
(c) Manometer (d) Lactometer

28. Thermostat is used to_____.
(a) Measure heat (b) Measure temperature
(c) Measure illness (d) Measure coldness

29. Which instrument is used to receive radiowaves from objects in space?
(a) Radio telescope (b) Radiograph
(c) Seismograph (d) Atomic telescope

30. The minimum temperature that can be measured with a mercury thermometer is_____.
(a) 0°C (b) -273°C
(c) -39°C (d) -143°C

31. A body whose surface is completely blackened is an excellent _____.
(a) Absorber of heat (b) Emitter of heat
(c) Absorber as well as emitter (d) None of these

32. When salt is added into water, its boiling point_____.
(a) Increases (b) Decreases
(c) Remains same (d) None of these

33. A hot body is kept in vacuum. What will happen to its temperature after some time?
(a) Remain the same (b) Increase
(c) Decrease (d) May increase or decrease

34. The dew point is determined by_____.
(a) Temperature (b) Wind velocity
(c) Barometer pressure (d) Humidity

35. Which instrument is used to measure the quantity of rainfall?
(a) Barometer (b) Hydrometer
(c) Rainmeter (d) Rain gauge

36. Why does a ball which falls down bounce up?
(a) Gravity (b) Speed
(c) Elasticity (d) Acceleration

37. Below –273°C molecules of a substance don't move, that temperature is called_____.
(a) Absolute minimum (b) Absolute possible
(c) Minimum temperature (d) Absolute zero

38. Which of the following is the best conductor?
(a) Filtered hot water (b) Cold water
(c) Distilled water (d) All of the above

39. Woollen clothes are warmer than the cotton ones because _____.
(a) They are better absorbers of heat
(b) They are better insulators of heat
(c) They are better radiators of heat
(d) All of the above

40. When common salt is mixed with ice, the freezing point is _____.
(a) Lowered (b) Raised
(c) Remains unaffected (d) First lowered and then rained

41. Laws of gravitation were given by_____.
(a) Mendel (b) Einstein
(c) Newton (d) None of these

42. Energy of the cell is stored in_____.
(a) Nucleus (b) Mitochondria
(c) Vacuole (d) None of these

43. Quartz is chemically a_____.
(a) Carbonate (b) Silicate
(c) Aluminates (d) None of these

44. Standard pressure is_____.
(a) 760 mm Hg (b) 790 mmHg
(c) 273 mm Hg (d) All of the above

45. The energy possessed by a body due to its position is_____.
(a) Kinetic energy (b) Potential energy
(c) Both kinetic and potential (d) None of these

46. The wavelength of blue green light is greater than _____.
(a) Red light (b) Blue light
(c) Violet light (d) Both (a) and (b)

47. In a heat engine, heat energy is changed into_____.
(a) Chemical energy (b) Electrical energy
(c) Mechanical energy (d) None of these

48. Frequency of audible sound is_____.
(a) 20,000 Hz (b) 20,000,000 Hz
(c) 200 Hz (d) 200,000 Hz

49. Cheapest source of producing electricity is_____.
(a) Coal (b) Oil
(c) Water (d) Gas

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50. The smallest unit of measurement of wavelength is_____.
(a) Micrometer (b) Angstrom
(c) Nanometer (d) None of these

ANSWERS

1.	c	2.	b	3.	b	4.	b	5.	a
6.	a	7.	a	8.	a	9.	a	10.	a
11.	d	12.	b	13.	b	14.	a	15.	c
16.	c	17.	a	18.	a	19.	a	20.	a
21.	b	22.	a	23.	c	24.	d	25.	b
26.	b	27.	c	28.	b	29.	a	30.	c
31.	a	32.	a	33.	c	34.	d	35.	d
36.	c	37.	d	38.	c	39.	b	40.	a
41.	c	42.	b	43.	b	44.	a	45.	b
46.	d	47.	c	48.	a	49.	c	50.	c

24. The heat received by earth from the sun is known as_____.
(a) Insulations (b) Solar heat
(c) Solar radiations (d) Thermal radiations

27. Cosmic rays_____.
(a) Are charged particles
(b) Are uncharged particles
(c) Can be charged as well as uncharged
(d) None of these

28. A person wants to see his full erect image in the same size. Which of the following mirrors can be used?
(a) Convex mirror (b) Concave mirror
(c) Plane mirror (d) Both (a) or (b)

29. A person standing before a furnace receives most of the heat by_____.
(a) Conduction (b) Convection
(c) Radiation (d) conduction and convection

30. Light year is a unit of _____.
(a) Power (b) Time
(c) Distance (d) Intensity of light

31. Uranium is used as a raw material in which of the following sectors?
(a) Oil (b) Steel
(c) Mining (d) Energy generation

32. Which of the following is considered as a non-conventional source of energy?
(a) Solar (b) Nuclear power
(c) Coal (d) Natural gas

33. A toy boat in a tank sinks, the level of water will_____.
(a) Increase (b) Decrease
(c) Fluctuate (d) Remain the same

34. The sun spectrum is_____.
(a) Line spectrum (b) Band spectrum
(c) Continuous spectrum (d) None of these

35. The branch of physics that deals with the measurement of light is called _____.
(a) Electrodynamics (b) Photometry
(c) Spectrology (d) Spectroscopy

36. The phenomenon of bending of light at the surface of separation of two media is called_____.
(a) Deflection of light (b) Reflection of light
(c) Refraction of light (d) Absorption of light

37. Laser is an acronym for light amplification by_____.
(a) Stimulated Emission of Radiation
(b) Spontaneous Emission of Radiation

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(c) Simulated Energetic Radiation
(d) Spontaneous Emission of Radiowaves

38. **The Blue colour of the sky is due to_____.**
(a) Diffraction of light (b) Dispersion of light
(c) Reflection of light (d) Refraction of light

39. **Pyrheliometer is an instrument used for_____.**
(a) Comparing the luminous intensity of the source of light
(b) Measuring solar radiations
(c) Measuring high temperatures
(d) Measuring heat radiations

40. **Which of the following is a common constituent of transistor?**
(a) Beryllium (b) Copper
(c) Germanium (d) Iron

41. **Safety wires used in electric circuits is made of a material having _____.**
(a) Low melting point (b) High melting point
(c) High resistance (d) Low specific heat

42. **For which of the following is a diode used?**
(a) Amplification (b) Modulation
(c) Rectification (d) Oscillation

43. **The speed of sound is maximum through which of the following medium?**
(a) Air (b) Glass
(c) Water (d) Wood

44. **Which of the following is used in semi-conductors?**
(a) Aluminium (b) Copper
(c) Silicon (d) None of these

45. **What elementary particles are equal in mass?**
(a) Neutron and proton (b) Electron and proton
(c) Neutron and electron (d) None of these

46. **Who invented radio?**
(a) Graham Bell (b) Marconi
(c) Newton (d) Otto Hahn

47. **Which of the following transformation of energy takes place in microphone?**
(a) Electrical energy into sound
(b) Sound into electrical energy
(c) Mechanical energy into sound
(d) Sound into mechanical energy

48. **Echo is the effect produced due to_____.**
(a) Absorption of sound (b) Dispersion of sound
(c) Reflection of sound (d) Refraction of sound

49. **Which of the following is a unit of frequency?**
(a) Newton (b) Joule
(c) Hertz (d) Ampere

50. **According to the special theory of relativity, the laws of physics in different frame of references are**
(a) Same (b) Different
(c) Valid (d) Same when they are inertial

ANSWERS

1.	c	2.	b	3.	a	4.	c	5.	b
6.	a	7.	b	8.	c	9.	c	10.	a
11.	a	12.	c	13.	c	14.	c	15.	c
16.	c	17.	c	18.	b	19.	d	20.	b
21.	d	22.	b	23.	a	24.	d	25.	a
26.	a	27.	c	28.	c	29.	c	30.	c
31.	d	32.	b	33.	a	34.	c	35.	b
36.	c	37.	a	38.	b	39.	b	40.	c
41.	a	42.	c	43.	b	44.	c	45.	c
46.	b	47.	b	48.	b	49.	c	50.	d

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SAMPLE PRACTICE TEST – 8

1. **X-rays are similar to nature_____.**
   (a) Electrons (b) Helium nuclei
   (c) Electromagnetic radiations (d) None of these

2. **Black hole_____.**
   (a) Doesn't exist
   (b) Absorbs all radiations that fall on it
   (c) Converts ultraviolet radiations into infrared radiations
   (d) Imaginary concept in physics

3. **The instrument used for measuring purity of milk is_____.**
   (a) Hydrometer (b) Lactometer
   (c) Algestimeter (d) None of these

4. **What is acoustics?**
   (a) Science of waves (b) Science of sound
   (c) Science of light (d) Science of radiography

5. **What is astrophysics?**
   (a) Study of physical nature of stars
   (b) Study of universe
   (c) Study of earth
   (d) Study of astrology

6. **What is agrostology?**
   (a) Study of grasses. (b) Study of plants
   (c) Study of forests (d) Study of agriculture

7. **The branch of mathematics that deals with numbers is_____.**
   (a) Arithmetic (b) Algebra
   (c) Statistics (d) Trigonometry

8. **The noise pollution is measured in the unit called _____.**
   (a) Decibel (b) Curie
   (c) Sigma (d) None of these

9. **For the treatment of near vision, the lens that is used is _____.**
   (a) Biconcave (b) Convex
   (c) Plane mirror (d) None of these

10. **Sphygmomanometer is used for measuring_____.**
    (a) Blood pressure (b) Heartbeat
    (c) Tooth ache (d) Temperature

11. **Which instrument is used for measuring very high temperature?**
    (a) Thermometer (b) Thermmeter
    (c) Hydrometer (d) Pyrometer

12. **Pyroheliometer is used for_____.**
    (a) Measuring radiation (b) Measuring solar radiation

31.	d	32.	a	33.	b	34.	d	35.	d
36.	d	37.	a	38.	c	39.	d	40.	b
41.	a	42.	b	43.	d	44.	a	45.	b
46.	a	47.	a	48.	a	49.	b	50.	d

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SAMPLE PRACTICE TEST – 10

1. _____ is the smallest quantity.
   (a) 0.635×10^6 cm (b) 0.635×10^5 cm
   (c) 0.635×10^4 cm (d) 0.635×10^3 cm

2. Two forces of 10N and 7N are applied simultaneously to an object. The maximum value of their resultant is _____.
   (a) 10N (b) 12N
   (c) 17N (d) 20N

3. _____ pair of forces could create a resultant force of 7N.
   (a) 2N, 6N (b) 3N, 8N
   (c) 5N, 2N (d) 4N, 3N

4. A protected tank contains 2.5 cubic metres of an ideal gas under a pressure of 0.5 atm. If the pressure is elevated to 3 atm while temperature is kept constant then _____ will be the new volume of the gas.
   (a) 0.12 cubic metres (b) 0.24 cubic metres
   (c) 0.32 cubic metres (d) 0.42 cubic metres

5. The _____ of a simple pendulum does not depend on the mass of the bob.
   (a) Period (b) Velocity
   (c) Acceleration (d) None of these

6. A van is travelling on a level main road at a speed of 15 m/s. If a braking force of 3,000 N takes the van to a stop in 10 s then the mass of the car is _____.
   (a) 100 kg (b) 200 kg
   (c) 300 kg (d) 2000 kg

7. A 10 kg sky rocket piece falling toward earth has a net downward acceleration of 5 m/s^2. The net descending force acting on the piece is _____.
   (a) 15 N (b) 25 N
   (c) 50 N (d) 100 N

8. A competition bike is speeding in the region of a flat, unbanked circular path whose radius is 250 metres. The bike's speed is constant at 50m/s. The mass of the bike is 2000 kg. The centripetal force necessary to keep the bike in its round path is provided by _____.
   (a) Weight of the bike (b) Mass of the bike
   (c) Friction (d) None of these

9. A projectile is launched at an angle of θ to the horizontal with an initial velocity y. In the nonexistence of any air resistance, _____ remains constant during flight
   (a) The vertical velocity (b) The horizontal velocity
   (c) The time of flight (d) None of these

10. One way in which a transistor diverges from a _____ is that the transistor but not the diode can amplify signals.
   (a) Cathode (b) Anode
   (c) Semiconductor diode (d) None of these

11. The noise of a danger signal to the west of you is transmitted to your ear by air _____.
   (a) Vibrating in a west-south direction
   (b) Vibrating in a west-east direction
   (c) Vibrating in a west-north direction
   (d) None of these

12. Transverse waves can be _____.
   (a) Polarised (b) Doubled
   (c) Quadruped (d) None of these

13. Transverse waves can be _____.
   (a) Doubled (b) Diffracted
   (c) Quadruped (d) None of these

14. _____ will have the minimum De Broglie wavelength.
   (a) An alpha particle (b) A beta particle
   (c) A gamma particle (d) None of these

15. In the _____, the trajectory of the alpha particles was in the shape of a hyperbola.
   (a) Rutherford scattering experiments
   (b) Newton's scattering experiments
   (c) Bohr's scattering experiments
   (d) None of these

16. An atom of a constituent varies from an atom of one of its _____ in the number of neutrons in nucleus.
   (a) Isotopes (b) Protons
   (c) Electrons (d) None of these

17. When a person uses a convex lens as a magnifying glass, the distance that the object must be _____ is less than one focal length.
   (a) From the objec (b) From the lens
   (c) From the path (d) None of these

18. The image of a vertical object on the retina of the eye is real and _____.
   (a) Straight (b) Reversed
   (c) Double (d) None of these

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19. In monochromatic red light, a blue glass will possibly appear to be _____.
(a) Green (b) Orange
(c) Black (d) White

20. A girl holds a nickel coin in a space ship flying at a speed close to the speed of light. To an unchanging observer viewing the face of the coin as it passes by, the nickel might appear the width of a _____.
(a) Completely (b) Section
(c) Dime (d) None of these

21. The principle of interference is necessary for_____.
(a) The appearance of colours (b) The production of beats
(c) The appearance of curves (d) None of these

22. The principle of interference is necessary for _____.
(a) The appearance of curves
(b) The appearance of colours in thin oil films
(c) The appearance of beats
(d) None of these

23. A man is standing in a crane that goes up with constant positive acceleration. Which of the following is true of the push he exerts on the bottom of the crane?
(a) Its value depends on the elevator's acceleration
(b) It is equal to less than her weight
(c) Both a & b
(d) None of these

24. Monochromatic light with a wavelength of 6.0×10^{-7}m occurs upon two slots that are 2.0×10^{-5} m away. As a result, an interference pattern comes into view on a screen 2 m away from the slots and parallel to the slots. _____ is the predictable distance between the central maximum and the next bright line on the screen.
(a) 4.0×10^{-2} m (b) 5.0×10^{-2} m
(c) 6.0×10^{-2} m (d) 7.0×10^{-2} m

25. What is the frequency of the photon for the changeover from n = 3 to n = 2?
(a) 7.0×10^{14} Hz (b) 5.0×10^{14} Hz
(c) 4.6×10^{14} Hz (d) 2.8×10^{14} Hz

26. If the half life of $^{234}_{90}$Th is 24 days then the amount of a 12 g model left over after 96 days is _____.
(a) 0.50 g (b) 0.75 g
(c) 0.75 g (d) 1 g

27. _____ is mostly like a gamma ray in its properties
(a) Alpha ray (b) Beta ray
(c) Parallel ray (d) None of these

SAMPLE PRACTICE TEST – 9

1. Unit of electricity kilowatt hour is the unit of_____.
(a) Force (b) Work
(c) Power (d) Energy

2. Period of famous Muslim scientists is _____.
(a) 7th to 13th century (b) 7th–10th century
(c) 10th to 13th century (d) 6th –12th century

3. Heat radiations travels at a speed equal to_____.
(a) Speed of air (b) Speed of light
(c) Both air and light (d) None of these

4. _____ colour has shortest wavelength.
(a) Red (b) Blue
(c) Green (d) Indigo

5. _____ metal has the highest electrical conductivity.
(a) Silver (b) Tungsten
(c) Copper (d) Aluminium

6. Light travels fastest in_____.
(a) Glass (b) Vacuum
(c) Plastics (d) Air

7. _____cannot be nominated for Noble Prize.
(a) Physicists (b) Scientists
(c) Astronomers (d) Economists

8. Speed of the wind is measured by_____.
(a) Barometer (b) Hygrometer
(c) Perimeter (d) Anemometer

9. Curie is a unit of_____.
(a) Radioactivity (b) Force
(c) Pressure (d) Torque

10. A nanometer is_____.
(a) 10^{-3} metres (b) 10^{-6} metres
(c) 10^{-6} metres (d) 10^{-12} metres

11. The energy possessed by water in a dam is_____.
(a) Electrical energy (b) Kinetic energy
(c) Potential energy (d) Mechanical energy

12. _____ is the most powerful form of energy in the universe.
(a) Nuclear energy (b) Chemical energy
(c) Light energy (d) Wind energy

13. In fission, we _____ the nucleus of an atom.
(a) Split (b) Joint together
(c) Separate (d) Heat

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14. In _____, nuclei of two atoms are joined.
(a) Fusion (b) Separator
(c) Break (d) None of these

15. The atom is made up of _____ different kinds of particles.
(a) Three (b) Four
(c) Two (d) One

16. The nucleus is held together by _____ forces.
(a) Nuclear force (b) Electromagnetic force
(c) Force of gravity (d) None of these

17. If electron, proton, neutron and alpha particle all have equal energies then which has the shortest wave length?
(a) Electron (b) Proton
(c) Neutron (d) Alpha particle

18. More useful nuclear fuel is
(a) U^{235} (b) U^{236}
(c) U^{238} (d) U^{239}

19. About _____ nations, use the nuclear energy to generate one-sixth of world's electricity.
(a) 30 (b) 50
(c) 25 (d) 35

20. The theory about the static, infinite and unchanging nature of the universe is called_____.
(a) Big Bang theory (b) Theory of Relativity
(c) Theory of natural selection (d) Steady state theory

21. The theory about the expanding nature of universe is given by _____.
(a) Galileo (b) Newton
(c) Edwin Hubble (d) None of these

22. The echo of Big Bang can be heard in the form of _____.
(a) Cosmic rays (b) Gamma rays
(c) Microwave radio signals (d) Infrared radiations

23. "Early Bird" was the first communication satellite launched by Russia in_____.
(a) 1920 (b) 1945
(c) 1965 (d) 1975

24. The frequency of radio waves is measured in_____.
(a) Hertz (b) Centimeter
(c) Cycles (d) Perc ycles

25. Galilio invented the first telescope in_____.
(a) 1619 (b) 1691
(c) 1609 (d) 1607

26. Refracting telescope consists of_____.
(a) Object (b) Eye piece
(c) Convex lenses (d) Object and eye piece

27. The langunge for scientific and mathematical use is_____.
(a) Fortran (b) Algol
(c) Cobol (d) Gpss

28. An essential part of a radio transmitter and reception system is_____.
(a) Antenna (b) Radar
(c) Amplifier (d) Transistor

29. Quartz is a crystalline part of _____.
(a) Silicon (b) Silicon dioxide
(c) Aluminium dioxide (d) None of these

30. Which is not an insulator?
(a) Rubber (b) Mica
(c) Brass (d) Glass

31. Which is a semi-conductor?
(a) Magnesium (b) Bronze
(c) Silver (d) Selenium

32. Electron donor impurity is_____.
(a) Arsenic (b) Chromium
(c) Vanadium (d) Cobalt

33. The conductivity of semiconductor changes with_____.
(a) Resistance (b) Temperature
(c) Current (d) Voltage

34. Anthrocene polymer is_____.
(a) Insulator (b) Conductor
(c) Super conductor (d) Semiconductor

35. Which of the following was not an early mean of communication?
(a) Gestures (b) Fire
(c) Smoke (d) Voice

36. The process in which slight impurities are added into the semiconductor is called _____.
(a) Doping (b) Addition
(c) Conducting (d) Insulating

37. The process by which information is attached to the carrier wave is known as _____.
(a) Modulation (b) Transmission
(c) Communication (d) Emission

38. Vacuum tubes have been replaced by_____.
(a) Semiconductors (b) Conductors
(c) Transistors (d) Diodes

39. Hologram means _____.
(a) Two dimensional (b) Graphical representation
(c) Dotted picture (d) Complete picture

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40. Which of the following has lower energy quanta?
(a) X-ray (b) White light
(c) γ-ray (d) None of these

41. An aperture is made up of _____.
(a) Diaphragm (b) Iris
(c) Lens (d) Retina

42. The film is covered with an emulsion of_____.
(a) Silver oxide (b) Silver bromide
(c) Silver chloride (d) Potassium bromide

43. The process of breaking down the scene into picture elements is known as_____.
(a) Printing (b) Copying
(c) Imaging (d) Scanning

44. The nuclear reactor gives energy in the form of_____.
(a) Heat (b) Light
(c) Electricity (d) Chemical energy

45. In metric system, energy is measured in_____.
(a) Erg (b) Joule
(c) Electron volt (d) Calorie

46. In heavy water which isotope of Hydrogen is used?
(a) Deuterium (b) Tritium
(c) Podium (d) Hydrogen

47. Types of nuclear reactors are_____.
(a) Five (b) Four
(c) Three (d) Seven

48. The amount of heat required to raise the temperature of one gram of water through one degree centigrade is called_____.
(a) Calorie (b) Newton
(c) Electron volt (d) Erg

49. One calorie is equal to _____ joules.
(a) 4.176 (b) 4.186
(c) 4.199 (d) 4.196

50. The pair production is based on law of conservation of _____.
(a) Mass (b) Energy
(c) Momentum (d) Charge

ANSWERS

1.	c	2.	a	3.	b	4.	b	5.	c
6.	b	7.	c	8.	a	9.	a	10.	c
11.	c	12.	a	13.	a	14.	a	15.	a
16.	a	17.	d	18.	a	19.	d	20.	d
21.	c	22.	c	23.	c	24.	a	25.	c
26.	d	27.	a	28.	a	29.	b	30.	c

28. The _____ is supposed to be a consequence of Nuclear fusion.
(a) Moon's energy (b) Sun's energy
(c) Nuclear energy (d) None of these

29. Two forces of 10 N and 7 N are applied at the same time to an object. The least value of their resultant is _____.
(a) 1 N (b) 3 N
(c) 5 N (d) 8 N

30. _____ is the largest quantity.
(a) 0.000047×10^4 cm (b) 0.00047×10^3 cm
(c) 0.00047×10^2 cm (d) 0.00047×10^1 cm

31. The Celsius temperature of an object is augmented 90° then its increase on the Kelvin scale will be _____.
(a) 40 K (b) 90 K
(c) 373 K (d) 212 K

32. When alpha particles are directed at a skinny metallic foil, it can be noted that most of the particles pass through with practically no _____.
(a) Deflection (b) Diffraction
(c) Resistance (d) None of these

33. In simple harmonic motion, the maximum velocity arises when _____.
(a) The acceleration is a zero
(b) The acceleration is minimum
(c) The acceleration is maximum
(d) None of these

34. Ball A is dropped horizontally at the same time as ball B is released and allowed to fall. If air resistance is negligible and both start from the same statures then A and B will arrive at the level floor _____.
(a) At the same time (b) A reaches first
(c) B reaches first (d) None of these

35. Ball A is projected upright at an identical time as ball B is projected straight. If air resistance is minor and both start from the same height then
(a) A will reach the level ground first
(b) B will reach the level ground first
(c) At the same time
(d) None of these

36. _____ in an ideal gas entail that there is no change in Pressure.
(a) Volume (b) Warmth
(c) Isobaric amends (d) External energy

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37. _____ may be attained by using light from a sodium vapour lamp.
(a) A bright line spectrum (b) A yellow line spectrum
(c) A blue line spectrum (d) A dark line spectrum

38. Colours in a soap bubble are reasoned by _____.
(a) Sum (b) Manifestation
(c) Interference (d) Appearance

39. A pendulum of length L has a period T. If the period is to be twice then _____ should be quadrupled.
(a) The length of the cord (b) The length of the pendulum
(c) The length of the mop wrench (d) None of these

40. _____ is equivalent to one Pascal of gas pressure.
(a) 10 kg . $m^{-1}s^{-2}$ (b) 1 kg/m . s^{-2}
(c) 100 kg . $m^{-1}s^{-2}$ (d) None of these

41. A gas is allowed to spread out isothermally from a volume of 100 cm^3 to a volume of 400 cm^3. If the inventive pressure of the gas was 4 atm then _____ will be the new pressure.
(a) 1 atm (b) 10 atm
(c) 50 atm (d) None of these

42. Lenz's is an electrical restatement for _____.
(a) Conservation law of energy
(b) Conservation law of momentum
(c) Conservation law of heat (d) None of these

43. A wool cloth turns out to be _____ as it loses electrons.
(a) Positively charged (b) Negatively charged
(c) Same charged (d) None of these

44. _____ will be formed by moving electrons.
(a) A magnetic field (b) An electric field
(c) A negative field (d) None of these

45. Water is densest at _____ temperature.
(a) 0°C (b) 4°C
(c) 100°C (d) 1000°C

46. If the flux density were _____ for a moving electron then the force on the electron would be doubled.
(a) Kept same (b) Halved
(c) Doubled (d) None of these

47. Three forces 6, 8 and 10 N are acting on a particle in equilibrium. The resultant of _____ forces has a magnitude of 6 N.
(a) 8 N and 0 N (b) 8 N and 10 N
(c) 4 N and 6 N (d) None of these

48. _____ unit(s) is used to express the amount of heat absorbed by a body.
(a) Ergs (b) Calories
(c) Joules (d) All of these

49. A barden ball is dropped horizontally from a definite height. It hits the ground in 10 s. If air resistance is minor and the original speed of the object is 30 m/s then its acceleration during the third second is _____.
(a) 950 cm/s^2 (b) 960 cm/s^2
(c) 970 cm/s^2 (d) 980 cm/s^2

50. Momentum is a quantity whose unit might be the _____.
(a) g.cm/s^3 (b) g.cm/s^2
(c) g.cm/s (d) g.cm/s^2

ANSWERS

1.	c	2.	c	3.	a	4.	d	5.	a
6.	d	7.	c	8.	c	9.	b	10.	c
11.	b	12.	a	13.	b	14.	a	15.	a
16.	a	17.	b	18.	b	19.	c	20.	c
21.	b	22.	b	23.	c	24.	c	25.	c
26.	b	27.	b	28.	b	29.	b	30.	a
31.	b	32.	a	33.	b	34.	a	35.	b
36.	c	37.	a	38.	c	39.	b	40.	b
41.	a	42.	a	43.	a	44.	a	45.	b
46.	c	47.	b	48.	d	49.	d	50.	c

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MISCELLANEOUS MCQs

1. A train of 150m length is going towards north at a speed of 10 m/s. A bird flies at a speed of 5 m/s towards south similar to the railway track. The time taken by the bird to cross the train will be equal to _____.
   (a) 10 s (b) 15 s
   (c) 20 s (d) 30 s

2. _____ is the point where light rays from infinity congregate after passing through a lens.
   (a) Focus (b) Mean point
   (c) Midpoint (d) Perpetuity

3. A crystal lattice is a _____arrangement of atoms in a crystal.
   (a) Prearranged (b) Curve
   (c) Straight (d) None of these

4. Bending of light rays, when they go through a different medium, is known as _____.
   (a) Reflection (b) Convection
   (c) Refraction (d) Radiation

5. Metals expand on heating and _____on cooling.
   (a) Contract (b) Spread
   (c) Smell (d) None of these

6. The wire of an electric bulb is called_____.
   (a) Filament (b) Sparkling wire
   (c) Brilliant wire (d) Dull wire

7. _____ is the apparatus for stepping up or down the voltage of AC supply.
   (a) A galvanometer (b) A generator
   (c) A transformer (d) None of these

8. If the radius of earth's orbit is made one fourth then the duration of a year will become _____.
   (a) 1/6 times (b) 1/8 times
   (c) 1/10 times (d) None of these

9. The speed of sound in air is _____.
   (a) 100 m/s (b) 200 m/s
   (c) 330 m/s (d) 430 m/s

10. The process in which no heat goes in or leaves the system is termed as _____.
    (a) Adiabatic (b) Isochoric
    (c) Curve (d) None of these

11. When a bicycle is driven on an uneven surface then its speed _____.
    (a) Augments (b) Decreases
    (c) Expands (d) None of these

12. External forces may or may not be_____.
    (a) Identical (b) Balanced
    (c) Opposite (d) Contradictory

13. It is extremely difficult to saunter on ice due to absence of _____.
    (a) Friction (b) Apathy
    (c) Lethargy (d) Boredom

14. _____is used in machines to decrease friction.
    (a) Heavy water (b) Sand powder
    (c) Graphite powder (d) None of these

15. Cannon after the firing recoils due to Newton's _____.
    (a) Conservation law of energy (b) First law of motion
    (c) Second law of motion (d) Third law of motion

16. You are stranded on a frictionless level surface and cannot put forth any horizontal force by pushing against the surface. You can get off by _____.
    (a) Shooting (b) Sneezing
    (c) Progressing your body (d) None of these

17. The source of _____ is secluded magnetic pole.
    (a) Magnetic field (b) Magnetic force
    (c) Electric charge (d) None of these

18. If the sides of a rectangle are 6.01 m and 12 m then the area of the rectangle is _____.
    (a) $42m^2$ (b) $52m^2$
    (c) $62m^2$ (d) $72m^2$

19. Newton's _____ law of motion gives a quantitative measurement of force.
    (a) Second (b) Third
    (c) First (d) None of these

20. For watching cricket match a binocular is preferred over to a terrestrial telescope because the binocular gives the proper _____.
    (a) One dimensional view (b) Two dimensional view
    (c) Three dimensional view (d) All dimensional view

21. The speed of turning round of a fan is measured by putting _____ in series with the fan.
    (a) A screen (b) A rheostat
    (c) A galvanometer (d) None of these

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22. Two insulated charged spheres A and B of radii 20 cm and 25 cm respectively and have an equivalent charge Q. They are adjoined by a copper wire and then they are detached then_____.
(a) The charge on B sphere will be greater than that of A
(b) The charge on A sphere will be greater than that of B
(c) Both will have same charge
(d) None of these

23. In the measurement of resistance by a metre bridge, the current is essentially upturned through the bridge wire to_____.
(a) Eliminate first error (b) Eliminate end error
(c) Eliminate current (d) None of these

24. If the distance covered by parallel plates of a capacitor is divided and dielectric constant is doubled then _____will increase four times.
(a) The capacitance (b) The voltage
(c) Current (d) None of these

25. Laser beam is highly monochromatic and an_____.
(a) Electromagnetic wave (b) Electric wave
(c) Curve wave (d) None of these

26. The change in entropy of the melting of 1kg of ice at 0°C will be _____.
(a) 10.3×10^2 J/K (b) 11.3×10^2 J/K
(c) 12.3×10^2 J/K (d) 13.3×10^2 J/K

27. A Carnot engine works between temperatures 727°C and 27°C. The efficiency of the engine is _____.
(a) 70% (b) 80%
(c) 90% (d) 100%

28. Light of frequency 8×10^{15} Hz is directed on a substance of photoelectric work function 6.125 eV. _____of the emitted photoelectrons will be 27 eV.
(a) The maximum kinetic energy
(b) The minimum kinetic energy
(c) The maximum potential energy
(d) The minimum potential energy

29. The heat produced in a circuit is dependent upon the resistance, current and time for which_____.
(a) The current is flown (b) The current is vanished
(c) The voltage is flown (d) None of these

30. A particle having charge 100 times that of an electron is rotating in a spherical path of radius 0.8 m with one rotation per second. The magnetic field fashioned at the centre will be _____.
(a) $10^{17} \mu_0$ (b) $10^{15} \mu_0$
(c) $10^{13} \mu_0$ (d) $10^{11} \mu_0$

31. The energy of an X-ray photon is 2 keV, its frequency will be _____.
(a) 5×10^{15} p/s (b) 5×10^{17} p/s
(c) 5×10^{19} p/s (d) 5×10^{21} p/s

32. If the critical angle for total internal reflection from medium to vacuum is 30° then the velocity in the medium will be _____.
(a) 1.5×10^2 m/s (b) 1.5×10^4 m/s
(c) 1.5×10^8 m/s (d) 1.5×10^{10} m/s

33. In a transformer, the number of turns of primary coil and secondary coil are 5 and 4 respectively and if 220 V is applied on the primary coil, then the ratio of primary current to the secondary current will be _____.
(a) 1:8 (b) 2:7
(c) 3:6 (d) 4:5

34. In a nuclear fission, _____mass is converted into energy.
(a) 0.1 % (b) 0.2 %
(c) 0.3 % (d) 0.4 %

35. The dimensional formula for Plancks constant is _____.
(a) $[ML^2T^0]$ (b) $[ML^2T^1]$
(c) $[ML^2T^2]$ (d) $[ML^2T^3]$

36. A dripping unlock umbrella is kept vertical and it is whirled about the handle at a uniform rate of 21 revolutions in 44 s. If the border of the umbrella is a circle of 1 m in diametre and the height of the border above the ground is 4.9 m then the locus of the drop is a circle of radius _____.
(a) 2.5 m (b) 4 m
(c) 9 m (d) 10 m

37. An object of mass 40kg having velocity 4 m/s collides with another object whose mass is 60 kg and velocity 2 m/s. If collision is completely inelastic then the loss in energy is _____.
(a) 30 J (b) 48 J
(c) 50 J (d) 60 J

38. If a particle is moving consistently with an angular velocity ω on the boundary of a circle of radius r then the linear velocity will be _____.
(a) rω (c) $r\omega^2$
(b) $r\omega^3$ (d) $r\omega^4$

39. A moving charge produces _____.
(a) Electric field (b) Electrostatic field
(c) Magnetic field (d) None of these

40. If a piece of ice floating on the surface of water in a glass melts completely then the level of water will be _____.
(a) Increase (b) Remains the same

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(c) Plummet (d) None of these

41. A Kelvin thermometer and a Fahrenheit thermometer are used to record temperature of melting metal and their readings are the same. What will a Celsius thermometer read at that temperature?
(a) 301.25° (b) 301.25°
(c) 301.25° (d) None of these

42. If two materials of equivalent volumes having different densities are dropped down from the similar height at the same time then both the bodies will reach _____.
(a) Opposite to each other (b) The earth simultaneously
(c) First body reaches first (d) Second body reaches first

43. When the bob of a pendulum is at the mean position then its total energy is _____.
(a) Unchangeable (b) Nothing
(c) Kinetic (d) Potential

44. If a red and a green pencil are taken in a room lighted with green light then red pencil will appear dark and _____.
(a) Green pencil appears red (b) Red pencil appears green
(c) Green pencil as green (d) None of these

45. The utilisation of electrical energy at domestic level is calculated in terms of_____.
(a) Kilowatt hour (b) Newton
(c) Meter per second (d) Meter hour

46. For protecting sensitive tool from the outside electric arc, it should be placed_____.
(a) Inside an iron can (b) Outside an iron can
(c) Inside in copper solution (d) None of these

47. Unexpected fall of a _____reading indicates storm.
(a) Galvanometer (b) Barometer
(c) Voltometer (d) None of these

48. If the forward voltage in P N junction is increased _____ will reduce.
(a) The width of depletion layer
(b) The length of depletion layer
(c) Depletion layer will remain the same
(d) Evaporation

49. The total charge persuaded in a conducting loop, when it is enthused in magnetic field, depends on_____.
(a) The total change in magnetic flux
(b) The total change of protons
(c) The total change of electrons
(d) None of these

50. If a coil carrying electric current is positioned in _____ then torque is formed.
(a) Uniform magnetic field (b) Variable magnetic field
(c) Parallel to magnetic field (d) None of these

51. A galvanometer of resistance 20 Ω gives full scale deflection with a current of 0.004 A. To convert it into an ammeter of range 1 A, the necessary shunt resistance will be _____.
(a) 0.02 Ω (b) 0.03 Ω
(c) 0.08 Ω (d) 0.10 Ω

52. A galvanometer having a resistance of 8 Ω is moved by a wire of resistance 2 Ω. If the total current is 1 A then the part of it passing through the shunt will be _____.
(a) 0.6 A (b) 0.8 A
(c) 1.2 A (d) 1.5 A

53. If a long empty copper pipe takes a current then _____ is twisted outside the pipe only.
(a) Strong magnetic field (b) Thin magnetic field
(c) Thin electric field (d) None of these

54. A charged particle of charge q and mass m enters vertically in a magnetic field B. If kinetic energy of the particle is E then frequency of rotation of that particle will be _____.
(a) 3qB/4m∏ (b) qB/2m∏
(c) 5qB/7m∏ (d) 8qB/9E∏

55. A bar magnet is oscillating in earth's magnetic field within a time period T. If its mass is quadruped then motion remains simple harmonic provided that _____.
(a) New period is equal to T (b) New period is equal to 2T
(c) New period is equal to 3T (d) New period is equal to 4T

56. If a ball and a rectangular chunk of different metals are completely engrossed in a liquid, having the similar loss of weight, then ball and rectangular block have _____.
(a) Same density (b) Same weight
(c) Same volume (d) Same depth

57. The escape velocity of a body from the earth depends on radius of the earth and _____.
(a) Centripetal force (b) The value of g
(c) Gravitational force (d) Volume

58. In an extrinsic semiconductor, the ratio of impurity atoms to pure atoms is 1 ratio _____.
(a) 100 (b) 103
(c) 106 (d) 109

59. A cyclist during a twist curves inside because he attains essential _____.
(a) Centripetal force (b) Gravitational force

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(c) Centrifugal force (d) None of these

60. If the surface of water in a pond is just going to freeze then the temperature of water underneath is _____.
(a) 0°C (b) 4°C
(c) 8°C (d) 10°C

61. The tangent law is appropriate only if there are two uniform _____ equally perpendicular to each other.
(a) Magnetic fields (b) Electric fields
(c) Weak fields (d) None of these

62. A moving coil galvanometer is changed into _____ by putting a low resistance in parallel.
(a) Resistor (b) Voltmeter
(c) An ammeter (d) None of these

63. A concave lens of focal length 20 cm is set aside and it makes contact with a convex lens of focal length 10 cm. The combination will have a focal length of _____.
(a) 20 cm (b) 30 cm
(c) 40 cm (d) 50 cm

64. The sensivity of a galvanometer depends on _____ of the coil.
(a) Number of the turns (b) Room temperature
(c) Current flow (d) None of these

65. Lamps used for road lighting are associated in _____ combination.
(a) Parallel (b) Series
(c) Simple (d) None of these

66. Physical quantity _____ is not defined in the stipulations of force per unit area.
(a) Stress (b) Strain
(c) Force (d) None of these

67. The distance enthused by affecting body is equivalent to area between _____.
(a) The speed time graph and X axis
(b) The speed time graph and time axis
(c) The speed time graph and Y axis
(d) None of these

68. An earth satellite has an orbit radius which is four times that of another communication satellite. The period of revolution of earth's satellite will be _____.
(a) 4 days (b) 6 days
(c) 8 days (d) 10 days

69. If two amounts are drawn on the graph paper against each other and the outcome so obtained is a straight line then this indicates that quantities are _____ to each other.
(a) Directly proportional (b) Inversely proportional
(c) Of same magnitude (d) None of these

70. When two amounts are drawn on the graph paper against each other and the RESULT so obtained is a curve line then this indicates that quantities are _____ to each other.
(a) Directly proportional (b) Inversely proportional
(c) Of same magnitude (d) None of these

71. The value of g is maximum at the _____.
(a) Poles (b) Edges of mountains
(c) Sea (d) None of these

72. If two forces, each of same magnitude act at a point, have no resultant then the angle between the two forces will be _____.
(a) 180° (b) 270°
(c) 360° (d) 90°

73. A sharp knife cuts much better again than a dull one because area of sharp knife is much _____ than the area of the blunt one.
(a) Lesser (b) Brighter
(c) Greater (d) Smoother

74. A black body produces radiations of all _____.
(a) Wavelengths (b) Sizes
(c) Colours (d) None of these

75. A near-sighted person cannot see clearly beyond 50 cm from his eye. The power in dioptre of vision lenses, which will facilitate him to see far objects clearly, is _____.
(a) +5 (b) +6
(c) +2 (d) +1

76. The freezing point on a thermometer is 20° C and the boiling point is 150°C. A temperature of 60°C on this thermometer will be read as _____.
(a) 48° C (b) 58° C
(c) 98° C (d) 100°C

77. Two gases X and Y, having the equivalent temperature, pressure and volume, are assorted. If the combination has the volume V and temperature T respectively then the pressure of the mixture will be _____.
(a) 4P (b) 3P
(c) 2P (d) 1P

78. In _____ of an ideal gas, temperature remains constant.
(a) Isothermal expansion (b) Conduction process
(c) Reduction process (d) None of these

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79. Fast neutrons can effortlessly be slowed down by passing them through_____.
(a) Soft water (b) Heavy water
(c) Normal water (d) None of these

80. The ratio of the _____ at invariable pressure to its explicit heat at constant volume is greater than one.
(a) Specific heat of water (b) Specific heat of air
(c) Specific heat of oil (d) Specific heat of a gas

81. Two elements having charges q_1 and q_2 are placed at a certain distance put forth a force F on each other. If the distance between the two particles is abridged to half and the charge on each particle is doubled then the force between the particles would be _____.
(a) 10F (b) 12F
(c) 14F (d) 16F

82. In order to increase the resolving power of a telescope, it is essential to enlarge_____.
(a) The diameter of the eyepiece
(b) The diameter of the lens
(c) The diameter of the object
(d) Diminish the diameter of the object

83. An empty metallic ball is charged. Inside the ball, the electric field is zero but_____.
(a) The electric field is finite (b) The potential is finite
(c) The potential is infinite (d) None of these

84. Two electric lights each of 100 watts and 220 V are associated in series to a supply of 220 V. The power consumed would be _____.
(a) 50 Watts (b) 100 Watts
(c) 150 Watts (d) 200 Watts

85. A cyclonic storm is designated by the _____.
(a) Sudden rise in temperature (b) Atmospheric pressure
(c) Sudden fall in temperature (d) None of these

86. Imperfect gases do not obey _____.
(a) Charle's law (b) Boyle's law
(c) Charle's and Boyle's laws (d) None of these

87. Sonar is a machine for position and ranging _____.
(a) Aircrafts (b) Submarines
(c) Missiles (d) None of these

88. Cyclotron is a device to create _____.
(a) High energy electrons (b) Low energy electrons
(c) Low energy protons (d) High energy protons

89. After a watch has been wound, it possesses _____.
(a) Kinetic energy (b) Mechanical potential energy

(c) Heat energy (d) None of these

90. Two plane mirrors are set at right angles and a plate is placed in any position between the mirrors. The number of images of the plate which will be _____.
(a) One (b) Two
(c) Three (d) Four

91. Lines of force owing to earth's horizontal magnetic field are parallel and in a_____.
(a) Straight line (b) Circle shape
(c) Oblique (d) Curled

92. Total internal reflection cannot be obtained when ray going from _____.
(a) Water to glass (b) Glass to water
(c) Glass to air (d) Water to air

93. When white light passes through a glass prism then we get _____on the other side of the prism.
(a) Spectrum (b) Darkness
(c) Dimness (d) None of these

94. _____ are due to the form of sun spots.
(a) Ozone effects (b) Electric fields
(c) Magnetic storms (d) None of these

95. Dynamo alters the mechanical energy into_____.
(a) Light energy (b) Heat energy
(c) Electrical energy (d) None of these

96. _____, in fact, acts as converter of energy.
(a) A dynamo (b) Electric charge
(c) Magnetic charge (d) None of these

97. For cubic lattice the sc has _____.
(a) The lowest packing fraction
(b) The highest packing fraction
(c) The normal packing fraction
(d) None of these

98. The dielectric constant k of an insulator cannot be _____.
(a) Equal to one (b) Positive direction
(c) Negative direction (d) Infinite

99. A current carrying coil is subjected to a uniform magnetic field. The coil will orient so that its field becomes_____.
(a) Opposite to the magnetic field
(b) Equal to the magnetic field
(c) Parallel to the magnetic field
(d) Perpendicular to magnetic field

100. _____ heat is needed to elevate the temperature of 1g of water by 1°C.
(a) 1 Calorie (b) 10 Calories

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(c) 20 Calories (d) 50 Joules

101. A hydrogen filled balloon gets bigger as it mounts and may even burst after_____. This happens because the atmospheric pressure decreases with height.
(a) Rising very high in the atmosphere
(b) Falling very low in the atmosphere
(c) Balloon remains same
(d) None of these

102. A radio wave of frequency 840MHz is thrown towards an aeroplane. The frequency of radio echo has a frequency 2.8 kHz more than the innovative frequency, then the velocity of aeroplane is _____.
(a) 0.2 km/s (b) 0.3 km/s
(c) 0.4 km/s (d) 0.5 km/s

103. _____used the phrase 'quantity of motion' for momentum.
(a) Christian Huygens (b) Newton
(c) James D. Bjorken (d) Ralph Charles Merkle

104. In order to find time, an astronaut orbiting in earth's satellite should make use of_____.
(a) A watch having a main string to keep it going
(b) A watch having a low string to keep it going
(c) A stopwatch
(d) None of these

105. A plastic cup containing water weighs 100g. It is positioned on the pan of a balance and a piece of metal weighing 70g and having a volume of 10cc is placed inside the water in the plastic cup. The weight of the plastic cup and the metal would be _____.
(a) 170gm (c) 180gm
(b) 190gm (d) 200gm

106. _____ is not a good heat insulator.
(a) Timber (b) Fleece
(c) Plastic (d) Iron

107. Aslam wired a battery in series with a resistance and an ammeter. He wired up a voltmeter in parallel with the resistance. Which of the following could Aslam not find with the apparatus as it was?
(a) The current flowing through the voltmeter
(b) The current flowing through the sequence
(c) The current flowing through the series
(d) None of these

108. If torque remains constant and the angular momentum of a body varies from A to 4A in 4s then the torque on the body will be _____.
(a) 5/4A (b) 1/3A
(c) 2/3A (d) 3/4A

109. A force acts on an object which is free to move. If we know the amount of the force and the mass of the object then Newton's 2nd law of motion facilitates us to conclude the object's _____.
(a) Heaviness (b) Velocity
(c) Acceleration (d) Location

110. Natural gas was discovered in Pakistan in_____.
(a) 1952 (b) 1978
(c) 1975 (d) 1960

111. Which country uses solar energy for boiling?
(a) France (b) USA
(c) UK (d) UAE

112. Dobson is the unit of
(a) Ozone in atmosphere (b) Radioactivity
(c) Loudness (d) Frequency

113. Boiling point of diesel is_____.
(a) 40-75°C (b) 175-250°C
(c) 125-175°C (d) 250-300°C

114. Amber is the unit of _____.
(a) Volume (b) Time
(c) Flow (d) Reactive power

115. If the distance between two point charges is doubled, the electric force will become _____.
(a) Doubled (b) Halved
(c) Four times (d) One-fourth

116. One US gallon is equal to _____.
(a) 4.56 litres (b) 3.78 litres
(c) 5.78 litres (d) 3.98 litres

117. Wyde is unit of_____.
(a) Amount of date (b) Dynamic viscosity
(c) Illuminance (d) Angle

118. The electricity generation capacity of Bhasha dam is_____.
(a) 3360 MW (b) 3300 MW
(c) 3000 MW (d) 3400 MW

119. One kwh is equal to_____.
(a) 3.6×10^6 joules (b) 3.4×10^6 joules
(c) 3.3×10^6 joules (d) 3.2×10^6 joules

120. The alpha particles are compact clusters of_____.
(a) 1 proton (b) 2 protons
(c) 3 protons (d) None of these

121. A nuclear power plant has the life of_____.
(a) 30-40 years (b) 25-50 years
(c) 35-40 years (d) 50 years

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122. Geiger-Miller counter is used to detect_____.
(a) Light (b) Photons
(c) Radioactive radiations (d) Electrons

123. Which state of matter is present at very high temperature?
(a) Gas (b) Plasma
(c) Solid (d) Liquid

ANSWERS

1.	a	2.	a	3.	a	4.	c	5.	a
6.	a	7.	c	8.	b	9.	c	10.	a
11.	b	12.	b	13.	a	14.	c	15.	d
16.	b	17.	a	18.	d	19.	a	20.	c
21.	b	22.	a	23.	b	24.	a	25.	a
26.	c	27.	a	28.	a	29.	a	30.	a
31.	b	32.	c	33.	d	34.	a	35.	b
36.	a	37.	b	38.	a	39.	c	40.	b
41.	a	42.	b	43.	c	44.	c	45.	a
46.	a	47.	b	48.	b	49.	a	50.	a
51.	c	52.	b	53.	b	54.	b	55.	b
56.	c	57.	b	58.	c	59.	a	60.	b
61.	a	62.	c	63.	a	64.	a	65.	a
66.	b	67.	b	68.	c	69.	a	70.	b
71.	a	72.	a	73.	a	74.	a	75.	c
76.	c	77.	c	78.	a	79.	b	80.	b
81.	d	82.	a	83.	b	84.	a	85.	b
86.	c	87.	b	88.	d	89.	b	90.	c
91.	a	92.	a	93.	a	94.	c	95.	c
96.	a	97.	a	98.	d	99.	c	100.	a
101.	a	102.	d	103.	b	104.	a	105.	a
106.	d	107.	a	108.	d	109.	c	110.	a
111.	a	112.	a	113.	a	114.	a	115.	c
116.	a	117.	a	118.	a	119.	a	120.	b
121.	a	122.	c	123.	b				

FAMOUS SCIENTISTS

Albert Einstein

$E = mc^2$

Sir Isaac Newton

"Philosophiae naturalis principia mathematica" commonly known as "Principia" is considered to be the greatest book on science ever published. Sir Isaac Newton wrote this in 1687.

Galileo Galilei

Galileo was the first scientist to use the telescope for observing that the earth revolves around the Sun. This was in contradictory to the belief held by majority.

Charles Darwin

He wrote the famous book on human evolution "On the origin of species by means of natural selection" This was published in 1859.

Johannes Kepler

Kepler compiled the Mars data on the basis of which he proposed the "Three Laws of Planetary Motion".

Louis Pasteur

He is known by his work on Separation of mirror image molecules and effect of polarised light and identification of the parasite namely killing silkworms.

James Maxwell

James Maxwell is renowned for his book "Treatise on Electricity and Magnetism" that was published in 1873. He developed the "Maxwell-Boltzmann kinetic theory of gases".

Edwin Hubble

He is famous for his work on galaxies. He gave "Hubble's Law" which stated that galaxies move away from each other at a speed ascertained by the distance between them. He classified galaxies on the basis of their distance, shape, brightness patterns and content.

Emil Fisher

His contributions to the field of science includes Synthesis of glucose, fructose, mannose starting with glycerol. He establish structures for 16 stereoisomers of the aldohexoses with glucose as the most prominent member.

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Paul Dirac

He won Nobel Prize in 1933 for his work on anti-particles. The "Dirac equation" was a developed version of the Schrodinger's equation.

Archimedes

He is known for his work on hydrostatics. His prominent works are "The Archimedes principle in hydrostatics", the Archimedes screw and the relation between the surface and volume of a sphere and the circumscribing cylinder.

Marie Curie

She is commonly known as Madam Curie. She won Nobel Prize in 1903 on Physics and in 1911, she was awarded Nobel Prize in Chemistry. She has the unique honour to win 2 Nobel Prizes in different branches of science.

Thomas Alva Edison

He set up the first industrial research laboratory in the world. He has 1093 patents which is a world record.

Max Planck

He is famous for introducing the quantum. He won the Nobel prize for Physics in 1918.

Nikola Tesla

In 1882, he stated the rotating magnetic field principle. He also invented the alternating current long distance electrical transmission system in 1988.

Aristotle

His most important works include Physics, Metaphysics, Politics, Poetics, Nicomachean Ethics and De Anima.

Leonardo da Vinci

He has the peculiarity of designing bridges, war machines, buildings, canals and forts.

Niels Bohr

In 1922, he won the Nobel Prize for Physics. He developed the "Bohr theory of the atom and liquid model of the atomic nucleus".

Nicholas Copernicus

He propounded the theory that the Sun was the fixed point and motions of the planets takes place around it. He also observed that The Earth rotates around its axis once a day and slow changes in the direction of this axis cause the equinoxes.

Rene Descartes

His revolutionary "Meditationes de prima philosophia, in quibus Dei existentia, & animae a corpore distinctio, demonstratur" was published in 1641.

Wilhelm Conrad Rontgen

In 1901, he won the Nobel Prize for Physics for discovering X-rays.

Carl Sagan

He promoted the Search for Extra Terrestrial Intelligence and was a pioneer in the field of exobiology.

Jane Goodall

She has the repute of being an authority on chimpanzees.

Jonas Salk

In 1952, he developed a vaccine for polio.

Alexander Graham Bell

His most important and most famous inventions include telephone and the metal detector.

Chandrasekhara Venkata Raman

He developed the Raman spectroscopy that provides information regarding the molecular structure.

Ernest Rutherford

He gave atomic theory in 1911 and classified forms of radiation.

Joseph John Thomson

He won the Nobel Prize for Physics in 1907 and developed the mass spectrograph.

William Ramsay

He independently discovered Helium and had a dominating role in the discovery of Argon, Krypton and Xenon.

Alfred Nobel

He established a fund for the Nobel Prize that is awarded yearly basis for the outstanding works in the areas of chemistry, physics, literature, international peace and medicine.

William Thompson

He propounded the second law of thermodynamics and proposed the Kelvin temperature scale as well.

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James Prescott Joule

He gave his famous Joule's law on the basis of which One determines the rate at which heat is produced by an electric current.

Julius Robert von Mayer

In collaboration with James P. Joule, he gave the first law of thermodynamics.

Henry Bessemer

He invented an economical procedure of steel making that burnt off impurities.

Robert Bunsen

He developed the spectroscope and discovered Cesium and Rubidium.

Thomas Graham

He developed procedure for the separation of crystalloids from colloids. This process is called "dialysis".

Michael Faraday

His laws of electrolysis were given in 1833.

Johann Wolfgang Dobereiner

He ascertained commonly the connection between elements and their atomic weight.

Amedeo Avagadro

He is known for Avogardro's number. He deduced that equal volumes of gases at the same conditions of temperature and pressure have the same number of molecules.

William Henry

He is the exponent of Henry's Law which states that the amount of gas absorbed by water increases as the gas pressure rises.

John Dalton

He is renowned for his the atomic theory.

Alessandro Volta

He has a distinction of inventing the practical battery using cells of two types of metals.

Antoine Lavoisier

He recognised and named oxygen and spurned the phlogiston theory.

Charles Augustin de Coulomb

Coulomb discovered the law of force between two charged bodies.

Henry Cavendish

Hydrogen and nitric acid are his most important discoveries.

Thomas Newcomen

His outstanding invention is the steam engine.

Robert Boyle

He propounded the Boyle's Law.

Blaise Pascal

He has observed the phenomenon of pressure. The SI unit of pressure Pa (Pascal) is named after him.

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FAMOUS PHYSICISTS AND THEIR ACHIEVEMENTS

Galileo Galilei (1564 – 1642)
Discovered the phases of Venus, the four satellites of Jupiter Io, Europa, Callisto, and Ganymede

Willebrord Snell (1580 – 1626)
Snell's law i.e., Law of Refraction

Robert Hooke (1635 – 1703)
Hooke's Law of Electricity

Christiaan Huygens (1625 – 1695)
Huygens Law

Sir Isaac Newton (1643 – 1727)
Newton's Laws of Motion, Universal gravitation

Benjamin Franklin (1706 – 1790)
First American physicist to discover two electric charges, 'positive' and 'negative'.

Charles Augustin de Coulomb (1736 – 1806)
Coulomb's Law

James Watt (1736 – 1819)
Morden condenser steam engine and centrifugal governor

Andre Marie Ampere (1775 – 1836)
Father of Electrodynamics

Amedeo Avogadro (1776 – 1856)
Avogadro's Law

George Ohm (1789 – 1854)
Ohm's Law

Michael Faraday (1791 – 1867)
Discovered electromagnetic induction

William Thomson or Lord Kelvin (1824 – 1907)
First and Second Law of Thermodynamics

Henrich Hertz (1857 – 1894)
Discovered radio waves and photoelectric effect

Pierre Curie (1859 – 1906)
Discovered piezoelectricity

Lord Ernest Rutherford (1871 – 1937)
Rutherford model

Albert Einstein (1879 – 1955)
Brownian motion and photoelectric effect

Sir Chandrasekhara Raman (1888 – 1970)
Scattering of light and found the Raman effect

Nikola Tesla (1857 – 1943)
Alternating current

Johannes van der Waals (1837 – 1923)
van der Waals equation of state

John Dalton (1766 – 1844)
Dalton's law of partial pressure

Daniel Gabriel Fahrenheit (1686 – 1736)
Determined the temperature scale called Fahrenheit scale

Blaise Pascal (1623 – 1662)
Built the mechanical calculator

Neils Bohr (1885 – 1962)
Theory of nuclear reactions and nuclear fission

Christian Doppler (1803 – 1853)
The Doppler effect

Satyendra Nath Bose (1894 – 1974)
Bose-Einstein condensate

Jocelyn Bell Burnell (1943)
Discovered radio pulsars

James Prescott Joule (1818 – 1889)
Joule's Law

Ernst Mach (1838 – 1916)
Mach number, Mach's principal

Rudolf Clausius (1822 – 1888)
Concept of entropy

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IMPORTANT DISCOVERIES IN PHYSICS

Discovery	Scientist	Year
Electron	J.J. Thomson	1897
Proton	Rutherford	1919
Neutron	James Dalton	1932
Atom	John Dalton	1808
Atomic Structure	Neil Bohr &Rutherford	1913
Laws of Motion	Newton	1687
Radioactivity	Henry Becquerel	1896
Radium	Madam Curie	1898
Principle of Relativity	Albert Einstein	1905
Electromagnetic Induction	Michael Faraday	1831
Raman Effect	C.V. Raman	1928
X-Rays	Röentgen	1895
Quantum theory	Max Plank	1900
Photo electric effect	Albert Einstein	1905
Law of Electrostatic attraction	Coulomb	1779
Photography (On metal)	J. Neepse	1826
Photography (On Paper)	W. Fox Talbot	1835
Periodic table	Mandeleev	1888
Law of Electric resistance	G.S. Ohm	1827
Law of floatation	Archemedes	1827
Thermionic emission	Edition	——
Diode Bulb	Sir J.S. Fleming	1904
Triode Bulb	Lee de Forest	1906
Nuclear Reactor	Anrico Fermi	1942
Law of electrolytic dissociation	Faraday	——
Wireless Telegram	Marconi	1901
Dynamite	Alfred Nobel	1867

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NOBEL PRIZE WINNERS ON PHYSICS

Year	Scientist's Name	Country
1901	Wilhelm C. Röntgen	Germany
1902	Hendrik A. Lorentz Pieter Zeeman	Netherlands Netherlands
1903	Antoine Henri Becquerel Pierre Curie Marie Curie	France France Poland - France
1904	John W. Strutt	Great Britain
1905	Philipp E. A. von Lenard	Germany
1906	Sir Joseph J. Thomson	Great Britain
1907	Albert A. Michelson	United States
1908	Gabriel Lippmann	France
1909	Carl F. Braun Guglielmo Marconi	Germany Italy
1910	Johannes D. van der Waals	Netherlands
1911	Wilhelm Wien	Germany
1912	Nils G. Dalen	Sweden
1913	Heike Kamerlingh Onnes	Netherlands
1914	Max von Laue	Germany
1915	Sir William H. Bragg Sir William L. Bragg	Great Britain Great Britain
1916		
1917	Charles G. Barkla	Great Britain
1918	Max K. E. L. Planck	Germany
1919	Johannes Stark	Germany
1920	Charles E. Guillaume	France
1921	Albert Einstein	Germany - United States
1922	Niels Bohr	Denmark
1923	Robert A. Millikan	United States
1924	Karl M. G. Siegbahn	Sweden
1925	James Franck Gustav Hertz	Germany Germany
1926	Jean B. Perrin	France
1927	Arthur H. Compton Charles T. R. Wilson	United States Great Britain
1928	Owen W. Richardson	Great Britain
1929	Prince Louis-Victor de Broglie	France
1930	Sir Chandrasekhara V. Raman	India
1931		
1932	Werner Heisenberg	Germany
1933	Paul A. M. Dirac Erwin Schrodinger	Great Britain Austria
1934		
1935	Sir James Chadwick	Great Britain
1936	Carl D. Anderson Victor F. Hess	United States Austria
1937	Clinton J. Davisson Sir George P. Thomson	United States Great Britain
1938	Enrico Fermi	Italy - United States
1939	Ernest O. Lawrence	United States
1940		
1941		
1942		
1943	Otto Stern	United States
1944	Isidor Isaac Rabi	United States
1945	Wolfgang Pauli	United States
1946	Percy W. Bridgman	United States
1947	Sir Edward V. Appleton	Great Britain
1948	Patrick M. S. Blackett	Great Britain
1949	Hideki Yukawa	Japan
1950	Cecil F. Powell	Great Britain
1951	Sir John D. Cockroft Ernest T. S. Walton	Great Britain Ireland
1952	Felix Bloch Edward M. Purcell	United States United States
1953	Frits Zernike	Netherlands
1954	Max Born Walter Bothe	Great Britain Germany
1955	Polykarp Kusch Willis E. Lamb	United States United States
1956	John Bardeen Walter H. Brattain William Shockley	United States United States United States
1957	Tsung-dao Lee Chen Ning Yang	United States United States

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1958	Pavel Cherenkov Ilya Frank Igor Y. Tamm	Soviet Union Soviet Union Soviet Union
1959	Owen Chamberlain Emilio G. Segrée	United States United States
1960	Donald A. Glaser	United States
1961	Robert Hofstadter Rudolf L. Mössbauer	United States Germany
1962	Lev D. Landau	Soviet Union
1963	Maria Goeppert-Mayer Eugene P. Wigner J. Hans D. Jensen	United States United States Germany
1964	Nikolai G. Basov Aleksander M. Prochorov Charles H. Townes	Soviet Union Soviet Union United States
1965	Richard P. Feynman Julian S. Schwinger Shinichiro Tomonaga	United States United States Japan
1966	Alfred Kastler	France
1967	Hans A. Bethe	United States
1968	Luis W. Alvarez	United States
1969	Murray Gell-Mann	United States
1970	Louis Néel Hannes Alfvén	France Sweden
1971	Dennis Gabor	Great Britain
1972	John Bardeen Leon N. Cooper John R. Schrieffer	United States United States United States
1973	Ivar Giaever Leo Esaki Brian D. Josephson	United States Japan Great Britain
1974	Martin Ryle Antony Hewish	Great Britain Great Britain
1975	James Rainwater Ben Mottelson Aage Bohr	United States United States - Denmark Denmark
1976	Burton Richter Samuel C. C. Ting	United States United States
1977	John H. Van Vleck Philip W. Anderson Nevill F. Mott	United States United States Great Britain

1978	Pyotr Kapitsa Arno Penzias Robert Wilson	Soviet Union United States United States
1979	Steven Weinberg Sheldon L. Glashow Abdus Salam	United States United States Pakistan
1980	James W. Cronin Val L. Fitch	United States United States
1981	Nicolaas Bloembergen Arthur Schaalow Kai M. Siegbahn	United States United States Sweden
1982	Kenneth G. Wilson	United States
1983	Subrahmanyan Chandrasekhar William A. Fowler	United States United States
1984	Carlo Rubbia Simon van der Meer	Italy Netherlands
1985	Klaus von Klitzing	Germany
1986	Ernest Ruska Gerd Binnig Heinrich Rohrer	Germany Germany Switzerland
1987	K. Alex Müller J. Georg Bednorz	Switzerland Germany
1988	Leon M. Lederman Melvin Schwartz Jack Steinberger	United States United States United States
1989	Norman F. Ramsey Hans G. Dehmelt Wolfgang Paul	United States Germany - United States Germany
1990	Richard E. Taylor Jerome I. Friedman Henry W. Kendall	Canada United States United States
1991	Pierre-Giles de Gennes	France
1992	Georges Charpak	Poland - France
1993	Joseph H. Taylor Russell A. Hulse	United States United States
1994	Bertram N. Brockhouse Clifford G. Shull	Canada United States
1995	Martin Perl Frederick Reines	United States United States
1996	David M. Lee Douglas D. Osheroff Robert C. Richardson	United States United States United States

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1997	Steven Chu William D. Phillips Claude Cohen-Tannoudji	United States United States France
1998	Robert B. Laughlin Horst L. Störmer Daniel C. Tsui	United States United States United States
1999	Gerardus 't Hooft Martinus J.G. Veltman	Netherlands Netherlands
2000	Zhores I. Alferov Herbert Kroemer Jack S. Kilby	Russia Germany United States
2001	Eric A. Cornell Wolfgang Ketterle Carl E. Wieman	United States Germany United States
2002	Raymond Davis Jr. Masatoshi Koshiba Riccardo Giacconi	United States Japan United States
2003	Alexei A. Abrikosov Vitaly L. Ginzburg Anthony J. Leggett	United States - Russia Russia United Kingdom - United States
2004	David J. Gross H. David Politzer Frank Wilczek	United States United States United States
2005	Roy J. Glauber John L. Hall Theodor W. Hänsch	United States United States Germany
2006	John C. Mather George F. Smoot	United States United States
2007	Albert Fert Peter Grünberg	France Germany
2008	Yoichiro Nambu Makoto Kobayashi Toshihide Maskawa	United States Japan Japan
2009	Charles K. Kao Willard S. Boyl George E. Smith	United Kingdom - China United States United States
2010	Andre Geim Konstantin Novoselov	Russia Russia
2011	Saul Perlmutter Brian P. Schmidt Adam G. Riess	United States Australia United States
2012	Serge Haroche David J. Wineland	French United States

2013	François Englert Peter W. Higgs	Belgian British
2014	Isamu Akasaki Hiroshi Amano Shuji Nakamura	Japanese Japanese Japanese-born American
2015	The 2015 Nobel Prize in Physics has not been awarded yet	

For Further Details Please Visit
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FUNDAMENTAL SYSTEM INTERNATIONAL (SI) UNITS

S. #	Fundamental Physical Quantities	Fundamental Units	Symbol
1.	Length	metre	m
2.	Mass	kilogram	kg
3.	Time	second	s
4.	Temperature	kelvin	K
5.	Electric current	ampere	A
6.	Luminous intensity	candela	cd
7.	Amount of substance	mole	mol

DERIVED SYSTEM INTERNATIONAL (SI) UNITS

S. #.	Physical Quantity	Name of SI Unit	Symbol for SI Units
1.	Force	Newton	N
2.	Pressure	Pascal	Pa
3.	Frequency	Hertz	Hz
4.	Energy	Joule	J
5.	Power	Watt	W
6.	Magnetic flux	Weber	Wb
7.	Electric charge	Coulomb	C
8.	Electric capacitance	Farad	F
9.	Electric potential	Volt	V
10.	Electric conductance	Siemen	S
11.	Electric resistance	Ohm	Ω
12.	Inductance	Henry	H

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SOME PREFIXES WITH SYMBOLS

S. #.	Power of 10	Prefix	Symbol
1.	10^{12}	Tera	T
2.	10^{9}	Giga	G
3.	10^{6}	Mega	M
4.	10^{3}	Kilo	K
5.	10^{2}	Hecto	H
6.	10^{1}	Deca	Da
7.	10^{-1}	Deci	d
8.	10^{-2}	Centi	c
9.	10^{-3}	Milli	m
10.	10^{-6}	Micro	μ
11.	10^{-9}	Nano	n
12.	10^{-12}	Pico	p

DIMENSIONAL FORMULAE OF FEW PHYSICAL QUANTITIES

S. #	Physical Quantity	SI Unit	Dimensional Formula
1.	Acceleration	ms^{-2}	$[M^0L^1T^{-2}]$
2.	Angle (θ)	radian	$[M^0L^0T^0]$
3.	Angular velocity	r/s	$[M^0L^0T^{-1}]$
4.	Angular acceleration	r/s^2	$[M^0L^0T^{-2}]$
5.	Area	m^2	$[M^0L^2T^0]$
6.	Capacitance	Farad	$[M^{-1}L^{-2}T^4I^2]$
7.	Current	A	$[M^0L^0T^0I^1]$
8.	Charge	Coulomb	$[M^0L^0T^1I^1]$
9.	Current density	$A\text{-}m^{-2}$	$[M^0L^{-2}T^0K^1]$
10.	Coefficient of elasticity	Nm^{-2}	$[M^1L^{-1}T^{-2}]$
11.	Compressibility	$N^{-1}m^2$	$[M^{-1}L^1T^2]$
12.	Density	kg/m^3	$[M^1L^{-3}T^0]$
13.	Displacement / Distance	m	$[M^0L^1T^0]$
14.	Electric field	N/C	$[M^1L^1T^{-3}I^{-1}]$
15.	Electric flux	V-m	$[M^1L^3T^{-3}I^{-1}]$
16.	Electrical conductivity	$\Omega^{-1}m^{-1}$	$[M^{-1}L^{-3}T^3I^2]$
17.	E.M.F.	V	$[M^1L^2T^{-3}I^{-1}]$
18.	Frequency	Hz	$[M^0L^0T^{-1}]$
19.	Force	N	$[M^1L^1T^{-2}]$
20.	Gravitational constant	$kg^{-1}\ m^3s^{-2}$	$[M^{-1}L^3T^{-2}]$
21.	Heat	J	$[M^1L^2T^{-2}]$
22.	Impulse	N.s	$[M^1L^1T^{-1}]$
23.	Latent heat	$J\,kg^{-1}$	$[M^0L^2T^{-2}]$
24.	Mass	kg	$[M^1L^0T^0]$
25.	Magnetic flux	Weber	$[M^1L^2T^{-2}I^{-1}]$
26.	Momentum	$kg\ ms^{-1}$	$[M^1L^1T^{-1}]$
27.	Moment of Inertia	$kg\ m^2$	$[M^1L^2T^0]$
28.	Pressure	$N.m^{-2}$	$[M^1L^{-1}T^{-2}]$
29.	Planck's constant	J-s	$[M^1L^2T^{-1}]$
30.	Rate of flow	m^3s^{-1}	$[M^0L^3T^{-1}]$
31.	Resistance	Ohm	$[M^1L^2T^{-3}I^{-2}]$
32.	Surface tension	Nm^{-1}	$[M^1L^0T^{-2}]$
33.	Specific gravity	No Unit	$[M^0L^0T^0]$
34.	Stress	Nm^{-2}	$[M^1L^{-1}T^{-2}]$
35.	Specific heat	$J\,kg^{-1}K^{-1}$	$[M^0L^2T^{-2}K^{-1}]$
36.	Torque	N-m or $Kg\ m^2s^{-2}$	$[M^1L^2T^{-2}]$
37.	Time	s	$[M^0L^0T^1]$
38.	Time period	s	$[M^0L^0T^1]$
39.	Velocity / speed	ms^{-1}	$[M^0L^1T^{-1}]$
40.	Volume	m^3	$[M^0L^3T^0]$
41.	Work / Energy	$kg\ m^2s^{-2}$	$[M^1L^2T^{-2}]$
42.	Wavelength	m	$[M^0L^1T^0]$
43.	Young's modulus	Nm^{-2}	$[M^1L^{-1}T^{-2}]$

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GLOSSARY OF PHYSICS TERMS

Absolute zero: The theoretical lowest temperature possible, which occurs when all random motion of molecules has ceased

Acceleration due to gravity: The acceleration produced in a body due to the earth's attraction is called acceleration due to gravity. It is denoted by the letter g. Its SI unit is m/s². On the surface of the earth, its average value is 9.8m/s².

Acceleration: The rate of change of velocity of a moving object is called its acceleration. The SI units of acceleration are m/s².

Adiabatic cooling: The decrease in temperature of an expanding gas that involves no additional heat flowing out of the gas. It is the cooling from the energy lost by expansion.

Adiabatic heating: The increase in temperature of compressed gas that involves no additional heat flowing into the gas. It is heating from the energy gained by compression.

Allotropic forms: Elements that can have several different structures with different physical properties-for example, graphite and diamond are two allotropic forms of carbon.

Alternating current: An electric current that first moves one direction, then the opposite direction with a regular frequency.

Amplitude of waves: The maximum displacement of particles of the medium from their mean positions during the propagation of a wave is called the amplitude of the wave.

Amplitude of an oscillation: The maximum displacement of a body from its mean position during an oscillatory motion is called the amplitude of oscillation.

Angle of incidence: Angle of an incident (arriving) ray or particle to a surface; measured from a line perpendicular to the surface (the normal)

Angle of reflection: Angle of a reflected ray or particle from a surface; measured from a line perpendicular to the surface (the normal)

Angular Acceleration: The rate of change of angular velocity of a body moving along a circular path is called its angular acceleration. Angular acceleration is denoted by a.

Angular Displacement: The angle described at the center of the circle by a moving body along a circular path is called angular displacement. It is measured in radians.

Angular Velocity: The rate of change of angular displacement is called angular velocity.

Astronomical unit: The radius of the earth's orbit is defined as one astronomical unit (A.U.)

Atom: The smallest unit of an element that can exist alone or in combination with other elements.

Atomic mass unit: Relative mass unit (u) of an isotope based on the standard of the carbon-12 isotope, which is defined as a mass of exactly 12.00 μ; one atomic mass unit (1 μ) is 1/12 the mass of a carbon-12 atom.

Atomic number: The number of protons in the nucleus of an atom is called atomic number.

Atomic Weight: Weighted average of the masses of stable isotopes of an element as they occur in nature, based on the abundance of each isotope of the element and the atomic mass of the isotope compared to carbon-12.

Avogadro's number: The number of carbon-12 atoms in exactly 12.00 g of C that is 6.02×10^{-23} atoms or other chemical units. It is the number of chemical units in one mole of a substance.

Balanced Forces: When a number of forces act on a body, and the resultant force is zero, then the forces are said to be resultant forces.

Balmer Series: A set of four line spectra, narrow lines of color emitted by hydrogen atom electrons as they drop from excited states to the ground state.

Barometer: An instrument that measures atmospheric pressure, used in weather forecasting and in determining elevation above sea level.

Beta particle: High-energy electron emitted as ionizing radiation from a decaying nucleus; also known as a beta ray.

Big Bang Theory: Current model of galactic evolution in which the universe was created from an intense and brilliant explosion from a primeval fireball.

Binding energy: The energy required to break a nucleus into its constituent protons and neutrons; also the energy equivalent released when a nucleus is formed.

Black hole: The theoretical remaining core of a supernova that is so dense that even light cannot escape.

Blackbody radiation: Electromagnetic radiation emitted by an ideal material (the blackbody) that perfectly absorbs and perfectly emits radiation.

Bohr model: Model of the structure of the atom that attempted to correct the deficiencies of the solar system model and account for the Balmer series.

Boiling point: The temperature at which a phase change of liquid to gas takes place through boiling. It is the same temperature as the condensation point.

Cathode rays: Negatively charged particles (electrons) that are emitted from a negative terminal in an evacuated glass tube.

Celsius scale of temperature: In the Celsius scale of temperature, the ice-point is taken as taken as the lower fixed point (0°C) and the steam-point is taken as the upper fixed point (100°C).

Centrifugal force: An apparent outward force on an object following a circular path.

Centripetal force: The force required to pull an object out of its natural straight-line path and into a circular path.

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Circular Motion: The motion of a body along a circular path is called circular motion.

Coefficient of linear expansion: The increase in length per unit original length per degree rise in temperature is called the coefficient of linear expansion. The SI unit of the coefficient of linear expansion is K^{-1}.

Compression: A part of a longitudinal wave in which the density of the particles of the medium is higher than the normal density is called a compression.

Condensation: A compression of gas molecules; a pulse of increased density and pressure that moves through the air at the speed of sound.

Conduction: The transfer of heat from a region of higher temperature to a region of lower temperature by increased kinetic energy moving from molecule to molecule.

Constructive interference: The condition in which two waves arriving at the same place, at the same time and in phase, add amplitudes to create a new wave.

Convection: Transfer of heat from a region of higher temperature to a region of lower temperature by the displacement of high-energy molecules.

Coulomb: Unit used to measure quantity of electric charge; equivalent to the charge resulting from the transfer of 6.24 billion particles such as the electron.

Coulomb's law: Relationship between charge, distance, and magnitude of the electrical force between two bodies.

Covalent bond: A chemical bond formed by the sharing of a pair of electrons.

Covalent compound: Chemical compound held together by a covalent bond or bonds.

Crest: The point of maximum positive displacement on a transverse wave is called a crest.

Critical angle: Limit to the angle of incidence when all light rays are reflected internally.

Decibel scale: A nonlinear scale of loudness based on the ratio of the intensity level of a sound to the intensity at the threshold of hearing.

Destructive interference: The condition in which two waves arriving at the same point at the same time out of phase add amplitudes to create zero total disturbance.

Dew point temperature: The temperature at which condensation begins.

Diffraction: The bending of light around the edge of an opaque object.

Direct current: An electrical current that always moves in one direction.

Direct proportion: When two variables increase or decrease together in the same ratio (at the same rate).

Dispersion: The effect of spreading colors of light into a spectrum with a material that has an index of refraction that varies with wavelength.

Distance: The actual length of the path traveled by a body irrespective of the direction is called the distance traveled. It is a scalar quantity.

Doppler effect: An apparent shift in the frequency of sound or light due to relative motion between the source of the sound or light and the observer.

Echo: A reflected sound that can be distinguished from the original sound, which usually arrives 0.1 sec or more after the original sound.

Elastic strain: An adjustment to stress in which materials recover their original shape after a stress is released.

Electric current: The flow of electric charge electric field force field produced by an electrical charge.

Electric generator: A mechanical device that uses wire loops rotating in a magnetic field to produce electromagnetic induction in order to generate electricity.

Electric potential energy: Potential energy due to the position of a charge near other charges.

Electrical conductors: Materials that have electrons that are free to move throughout the material; for example, metals.

Electrical energy: A form of energy from electromagnetic interactions; one of five forms of energy-mechanical, chemical, radiant, electrical, and nuclear.

Electrical insulators: Electrical nonconductors, or materials that obstruct the flow of electric current.

Electrical nonconductors: Materials that have electrons that are not moved easily within the material-for example, rubber; electrical nonconductors are also called electrical insulators.

Electrical resistance: The property of opposing or reducing electric current.

Electrolyte: Water solution of ionic substances that conducts an electric current.

Electromagnet: A magnet formed by a solenoid that can be turned on and off by turning the current on and off.

Electromagnetic force: One of four fundamental forces; the force of attraction or repulsion between two charged particles.

Electromagnetic induction: Process in which current is induced by moving a loop of wire in a magnetic field or by changing the magnetic field.

Electron pair: A pair of electrons with different spin quantum numbers that may occupy an orbital.

Electron volt: The energy gained by an electron moving across a potential difference of one volt; equivalent to 1.60×10^{-19} Joules.

Electron: Subatomic particle that has the smallest negative charge possible and usually found in an orbital of an atom, but gained or lost when atoms become ions.

Electronegativity: The comparative ability of atoms of an element to attract bonding electrons.

Electrostatic charge: An accumulated electric charge on an object from a surplus or deficiency of electrons; also called.

Energy: The capacity of a body to do work is called its energy. Energy is a scalar quantity. The SI unit of energy is Joule.

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Escape Velocity: The minimum velocity with which an object must be thrown upwards so as to overcome the gravitational pull and escape into space, is called escape velocity.

Fahrenheit scale of temperature: On the Fahrenheit scale, the ice point, the ice point (lower fixed point) is taken as 32°F and the steam point (upper fixed point) is taken as 212°F: The interval between these two points is divided into 180 equal divisions. Thus, unit division on the Fahrenheit scale is 1°F.

First law of motion: Every object remains at rest or in a state of uniform straight-line motion unless acted on by an unbalanced force.

Force: Force is a push or pull which tends to change the state of rest or of uniform motion , the direction of motion, or the shape and size of a body. Force is a vector quantity. The SI unit of force is Newton, denoted by N.

Force of gravitation: The force with which two objects attract each other by virtue of their masses is called the force of gravitation.

Fracture strain: An adjustment to stress in which materials crack or break as a result of the stress.

Free fall: The motion of a body towards the earth when no other force except the force of gravity acts on it is called free fall. All freely falling bodies are weightless.

Freezing point: The temperature at which a phase change of liquid to solid takes place; the same temperature as the melting point for a given substance.

Frequency (of waves): The number of waves produced per second is called its frequency.

Frequency (of oscillations): The number of oscillations made by an oscillating body per second is called the frequency.

Friction: The force that resists the motion of one surface relative to another with which it is in contact.

Fuel rod: Long zirconium alloy tubes containing fissionable material for use in a nuclear reactor.

Fundamental charge: Smallest common charge known; the magnitude of the charge of an electron and a proton, which is 1.60×10^{-19} coulomb.

Fundamental frequency: The lowest frequency (longest wavelength) that can set up standing waves in an air column or on a string.

Fundamental properties: A property that cannot be defined in simpler terms other than to describe how it is measured; the fundamental properties are length, mass, time, and charge.

Gamma ray: Very short wavelength electromagnetic radiation emitted by decaying nuclei.

Gases: A phase of matter composed of molecules that are relatively far apart moving freely in a constant, random motion and have weak cohesive forces acting between them, resulting in the characteristic indefinite shape and indefinite volume of a gas.

Gram-atomic weight: The mass in grams of one mole of an element that is numerically equal to its atomic weight.

Gram-formula weight: The mass in grams of one mole of a compound that is numerically equal to its formula weight.

Gram-molecular weight: The gram-formula weight of a molecular compound.

Gravitational constant G: The constant G which appears in the equation for Newton's law of gravitation is called the universal constant of gravitation or the gravitational constant. Numerically it is equal to the force of gravitation, which acts between two bodies of mass 1kg each separated by a distance of 1m. The value of G is $6.67 \times 10\text{-}11\ Nm^2/kg^2$.

Gravitational potential energy = mgh

Half-life: The time required for one-half of the unstable nuclei in a radioactive substance to decay into a new element.

Heat: Heat is a form of energy, which makes a body hot or cold. Heat is measured by the temperature-effect it produces in any material body. The SI unit of heat is Joule (J).

Heisenberg uncertainty principle: You cannot measure both the exact momentum and the exact position of a subatomic particle at the same time-when the more exact of the two is known, the less certain you are of the value of the other.

Hertz: Unit of frequency equivalent to one cycle per second.

Horsepower: Measurement of power defined as a power rating of 550 ft-lb/sec.

Hypothesis: A tentative explanation of a phenomenon that is compatible with the data and provides a framework for understanding and describing that phenomenon.

Ice-point: It is the melting point of pure melting ice under 1 atm pressure. The ice point is taken as the lower fixed point (0 deg C or 32 deg F) for temperature scales.

Impulse: The impulse acting on a body is equal to the product of the force acting on the body and the time for which it acts. If the force is variable, the impulse is the integral of Fdt from t0 to t1.

Impulsive force: The force which acts on a body for a very short time but produces a large change in the momentum of the body is called an impulsive force.

Incident ray: Line representing the direction of motion of incoming light approaching a boundary.

Inertia: The property of matter that causes it to resist any change in its state of rest or of uniform motion.

Infrasonic: Sound waves having too low a frequency to be heard by the human ear; sound having a frequency of less than 20 Hz.

Insulators: Materials that are poor conductors of heat-for example, heat flows slowly through materials with air pockets because the molecules

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making up air are far apart; also, materials that are poor conductors of electricity, for example, glass or wood.

Intensity: A measure of the energy carried by a wave.

Interference: Phenomenon of light where the relative phase difference between two light waves produces light or dark spots, a result of light's wavelike nature.

Intermolecular forces: Forces of interaction between molecules.

Internal energy: Sum of all the potential energy and all the kinetic energy of all the molecules of an object.

Inverse proportion: The relationship in which the value of one variable increases while the value of the second variable decreases at the same rate (in the same ratio).

Ionization: Process of forming ions from molecules.

Isostasy: A balance or equilibrium between adjacent blocks of crust.

Isotope: Atoms of an element with identical chemical properties but with different masses; isotopes are atoms of the same element with different numbers of neutrons.

Joule: Metric unit used to measure work and energy; can also be used to measure heat; equivalent to newton-metre.

Kelvin scale of temperature: On this scale, the ice-point (the lower fixed point) is taken as 273.15K and the (the upper fixed point) is taken as 373.15K. The interval between these two points is divided into 100 equal parts. Each division is equal to 1K.

Kepler's first law: Relationship in planetary motion that each planet moves in an elliptical orbit, with the sun located at one focus.

Kepler's laws of planetary motion: The three laws describing the motion of the planets.

Kepler's second law: Relationship in planetary motion that an imaginary line between the sun and a planet moves over equal areas of the ellipse during equal time intervals.

Kepler's third law: Relationship in planetary motion that the square of the period of an orbit is directly proportional to the cube of the radius of the major axis of the orbit.

Kilocalorie: The amount of energy required to increase the temperature of one kilogram of water one degree Celsius: equivalent to 1,000 calories.

Kilogram: The fundamental unit of mass in the metric system of measurement

Kinetic Energy: Energy possessed by a body by the virtue of its motion is called kinetic energy. Kinetic energy = 1/2 m v^2.

Latent heat of evaporization: The heat absorbed when one gram of a substance changes from the liquid phase to the gaseous phase, or the heat released when one gram of gas changes from the gaseous phase to the liquid phase.

Latent heat of fusion: The quantity of heat required to convert one unit mass of a substance from solid to the liquid state at its melting point (without any change in its temperature) is called its latent heat of fusion (L). The SI unit of latent heat of fusion is J kg-1.

Law of Conservation of Energy: The change of one form of energy into another is called transformation of energy. For example, when a body falls its potential energy is converted to kinetic energy.

Law of conservation of mass: Same as law of conservation of matter; mass, including single atoms, is neither created nor destroyed in a chemical reaction.

Law of conservation of momentum: The total momentum of a group of interacting objects remains constant in the absence of external forces.

Light-year: The distance that light travels through empty space in one year, approximately 9.5 x 10^11 km.

Line spectrum: Narrow lines of color in an otherwise dark spectrum; these lines can be used as.

Lines of force: Lines drawn to make an electric field strength map, with each line originating on a positive charge and ending on a negative charge; each line represents a path on which a charge would experience a constant force and lines closer together mean a stronger electric field.

Liquids: A phase of matter composed of molecules that have interactions stronger than those found in a gas but not strong enough to keep the molecules near the equilibrium positions of a solid, resulting in the characteristic definite volume but indefinite shape of a liquid.

Liter: A metric system unit of volume, usually used for liquids.

Longitudinal waves: The wave in which the particles of the medium oscillate along the direction along the direction of propagation of wave is called the longitudinal wave.

Loudness: A subjective interpretation of a sound that is related to the energy of the vibrating source, related to the condition of the transmitting medium, and related to the distance involved.

Luminosity: The total amount of energy radiated into space each second from the surface of a star.

Luminous: An object or objects that produce visible light; for example, the sun, stars, light bulbs, and burning materials are all luminous.

Magnetic field: Model used to describe how magnetic forces on moving charges act at a distance.

Magnetic poles: The ends, or sides, of a magnet about which the force of magnetic attraction seems to be concentrated.

Magnitude: The size of a measurement of a vector; scalar quantities that consist of a number and unit only, no direction, for example.

Mass defect: The difference between the sum of the masses of the individual nucleons forming a nucleus and the actual mass of that nucleus.

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Mass number: The sum of the number of protons and neutrons in a nucleus defines the mass number of an atom used to identify isotopes, for example, Uranium 238.

Mass: The quantity of matter contained in a body is called its mass. The SI unit of mass is kg.

Matter: Anything that occupies space and has mass.

Mechanical energy: The form of energy associated with machines, objects in motion, and objects having potential energy that results from gravity.

Mechanical wave: The waves, which need a material medium for their propagation, are called mechanical waves. Mechanical waves are also called elastic waves. Sound waves, water waves are examples of mechanical waves.

Melting point: The temperature at which a phase change of solid to liquid takes place; the same temperature as the freezing point for a given substance.

Meter: The fundamental metric unit of length.

Miscible fluids: Fluids that can mix in any proportion.

Model: A mental or physical representation of something that cannot be observed directly that is usually used as an aid to understanding.

Momentum: The momentum of a body is defined as the product of its mass and velocity. Its SI units are kg m/s.

Natural frequency: The frequency of vibration of an elastic object that depends on the size, composition, and shape of the object.

Negative electric charge: One of the two types of electric charge; repels other negative charges and attracts positive charges.

Newton: A unit of force is defined as Newton. A force is defined as 1 Newton when a mass of 1kg produces an acceleration of $1 m/sec^2$.

Newton's first law of motion: A body continues in a state of rest or of uniform motion in a straight line unless it is acted upon by an external force.

Newton's second law of motion: The force acting on a body is directly proportional to the product of its mass and acceleration produced by the force in the body.

Newton's third law of motion: To every action there is an equal and opposite reaction. The action and reaction are equal in magnitude but opposite in direction.

Newton's law of gravitation: The gravitational force of attraction acting between any two particles is directly proportional to the product of their masses, and inversely proportional to the square of the distance between them.

Non Uniform Speed: When a body travels unequal distances in equal intervals of time then it is said to have non-uniform speed.

Non Uniform Velocity: When a body covers unequal distances in equal intervals of time in a particular direction then it is said to have non uniform velocity.

Non Uniform Acceleration: When the velocity of a body increases by unequal amounts in equal intervals of time, it is said to have non-uniform acceleration.

Nuclear energy: The form of energy from reactions involving the nucleus.

Nuclear fission: Nuclear reaction of splitting a massive nucleus into more stable, less massive nuclei with an accompanying release of energy.

Nuclear force: One of four fundamental forces, a strong force of attraction that operates over very short distances between subatomic particles; this force overcomes the electric repulsion of protons in a nucleus and binds the nucleus together.

Nuclear fusion: Nuclear reaction of low mass nuclei fusing together to form more stable and more massive nuclei with an accompanying release of energy.

Nuclear reactor: Steel vessel in which a controlled chain reaction of fissionable materials releases energy.

Nucleons: Name used to refer to both the protons and neutrons in the nucleus of an atom.

Nucleus: Tiny, relatively massive and positively charged center of an atom containing protons and neutrons.

Ohm: Unit of resistance, equivalent to volts/amps.

Ohm's law: The electric potential difference is directly proportional to the product of the current times the resistance.

Orbital: The region of space around the nucleus of an atom where an electron is likely to be found.

Origin: The only point on a graph where both the x and y variables have a value of zero at the same time.

Oscillatory motion: The to and fro motion of a body about its mean position is called oscillatory motion. Oscillatory motion is also called vibratory motion. Oscillatory motion is periodic in nature.

Period (wave): The time required for one complete cycle of a wave.

Periodic wave: A wave in which the particles of the medium oscillate continuously about their mean positions regularly at fixed intervals of time is called a periodic wave.

Phase: The particles in a wave, which are in the same state of vibration, i.e. the same position and the same direction of motion are said to be in the same phase.

Photoelectric effect: The movement of electrons in some materials as a result of energy acquired from absorbed light.

Photons: A quanta of energy in light wave; the particle associated with light.

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Physical change: A change of the state of a substance but not the identity of the substance pitch the frequency of a sound wave.

Planck's constant: Proportionality constant in the relationship between the energy of vibrating molecules and their frequency of vibration; a value of 6.63×10^{-34} joule-sec.

Plasma: A phase of matter; a very hot gas consisting of electrons and atoms that have been stripped of their electrons because of high kinetic energies.

Plastic strain: An adjustment to stress in which materials become molded or bent out of shape under stress and do not return to their original shape after the stress is released.

Polarized: Light whose constituent transverse waves are all vibrating in the same plane; also known as plane polarized light.

Polaroid: A film that transmits only polarized light.

Positive electric charge: One of the two types of electric charge; repels other positive charges and attracts negative charges.

Positive ion: Atom or particle that has a net positive charge due to an electron or electrons being torn away.

Potential Energy: Energy possessed by a body by the virtue of its position or configuration is called potential energy.

Gravitational Potential Energy: The potential energy of a body by virtue of its height from the ground is called its gravitational potential energy.

Elastic Potential Energy: The potential energy of a body by virtue of its configuration (shape) is called its elastic potential energy.

Power: The rate of doing work is called power. Power is a scalar quantity. The SI unit of power is Watt (1 W = 1 J/sec).

Pressure: Power is defined as force per unit area.

Primary coil: Part of a transformer; a coil of wire that is connected to a source of alternating current.

Principle quantum number: From quantum mechanics model of the atom, one of four descriptions of the energy state of an electron wave; this quantum number describes the main energy level of an electron in terms of its most probable distance from the nucleus.

Projectile: An object thrown into space either horizontally or at an acute angle and under the action of gravity is called a projectile.

Trajectory: The path followed by a projectile is called its trajectory.

Range: The horizontal distance traveled by a projectile is called its range.

Time of flight: The time taken by a projectile from the moment it is thrown until it touches the ground is called its time of flight.

Proportionality constant: A constant applied to a proportionality statement that transforms the statement into an equation.

Pulse: A wave of short duration confined to a small portion of the medium at any given time is called a pulse. A pulse is also called a wave pulse.

Quanta: Fixed amounts; usually referring to fixed amounts of energy absorbed or emitted by matter

Quantum mechanics: Model of the atom based on the wave nature of subatomic particles, the mechanics of electron waves; also called wave mechanics.

Quantum numbers: Numbers that describe energy states of an electron; in the Bohr model of the atom, the orbit quantum numbers could be any whole number 1, 2, 3, and so on out from the nucleus; in the quantum mechanics model of the atom, four quantum numbers are used to describe the energy state of an electron wave.

Radiant energy: The form of energy that can travel through space.

Radiation: The transfer of heat from a region of higher temperature to a region of lower temperature.

Radioactive decay constant: A specific constant for a particular isotope that is the ratio of the rate of nuclear disintegration per unit of time to the total number of radioactive nuclei.

Radioactive decay series: Series of decay reactions that begins with one radioactive nucleus that decays to a second nucleus that decays to a third nucleus and so on until a stable nucleus is reached.

Radioactivity: Spontaneous emission of particles or energy from an atomic nucleus as it disintegrates.

Rarefaction: A part of a longitudinal wave in which the density of the particles of the medium is less than the normal density is called a rarefaction.

Real image: An image generated by a lens or mirror that can be projected onto a screen.

Rectilinear Motion: The motion of a body in a straight line is called rectilinear motion.

Reflected ray: A line representing direction of motion of light reflected from a boundary.

Reflection: The change when light, sound or other waves bounce backwards off a boundary.

Refraction: A change in the direction of travel of light, sound, or other waves crossing a boundary.

Resonance: When the frequency of an external force matches the natural frequency and standing waves are set up.

Restoring force: The force which tends to bring an oscillating body towards its mean position whenever it is displaced from the mean position is called the restoring force.

Resultant Force: A single force, which acts on a body to produce the same effect in it as, done by all other forces collectively, is called the resultant force.

Retardation: Negative acceleration is called retardation. In retardation the velocity of a body decreases with time.

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Reverberation: Apparent increase in volume caused by reflections, usually arriving within 0.1 second after the original sound.

Saturated air: Air in which equilibrium exists between evaporation and condensation; the relative humidity is 100 percent.

Saturated solution: The apparent limit to dissolving a given solid in a specified amount of water at a given temperature is called saturated solution.

Scalar Quantity: A physical quantity, which is described completely by its magnitude, is called a scalar quantity.

Scientific principle: A relationship between quantities concerned with a specific or narrow range of observations and behavior.

Second: The standard unit of time in both the metric and English systems of measurement.

Secondary coil: Part of a transformer, a coil of wire in which the voltage of the original alternating current in the primary coil is stepped up or down by way of electromagnetic induction.

Second's Pendulum: A simple pendulum whose time period on the surface of earth is 2 seconds is called the second's pendulum.

Semiconductors: Elements that have properties between those of a metal and those of a nonmetal are called semiconductors.

Shear stress: Produced when two plates slide past one another or by one plate sliding past another plate that is not moving.

Simple harmonic motion: The vibratory motion that occurs when there is a restoring force opposite to and proportional to a displacement.

Simple Pendulum: A heavy point mass (actually a small metallic ball), suspended by a light inextensible string from a frictionless rigid support is called a simple pendulum.

Solenoid: A cylindrical coil of wire that becomes electromagnetic when a current runs through it is called solenoid.

Solids: A phase of matter with molecules that remain close to fixed equilibrium positions due to strong interactions between the molecules, resulting in the characteristic definite shape and definite volume.

Sonic boom: Sound waves that pile up into a shock wave when a source is traveling at or faster than the speed of sound.

Specific heat: Each substance has its own specific heat, which is defined as the amount of energy (or heat) needed to increase the temperature of one gram of a substance one degree Celsius.

Speed: The distance traveled by a body in one unit of time is called its speed. It is a scalar quantity and it's SI unit's are m/s.

Spin quantum number: From quantum mechanics model of the atom, one of four descriptions of the energy state of an electron wave; this quantum number describes the spin orientation of an electron relative to an external magnetic field.

Standing waves: Condition where two waves of equal frequency traveling in opposite directions meet and form stationary regions of maximum displacement due to constructive interference and stationary regions of zero displacement due to destructive interference.

State of Motion: When a body changes it's position with respect to a fixed point in it's surroundings then it is said to be in a state of motion. The states of rest and motion are relative to the frame of reference.

State of Rest: When a body does not change its position with respect to a fixed point in it's surrounding, then it is said to be in a state of rest. The states of rest and motion are relative to the frame of reference.

Supersaturated: Containing more than the normal saturation amount of a solute at a given temperature.

Temperature: It is a numerical measure of hotness or coldness of a body. According to the molecular model, it is a measure of the average kinetic energy of the molecules of the body.

Tensional stress: The opposite of compressional stress; occurs when one part of a plate moves away from another part that does not move.

Thermal Capacity: The quantity of heat required to raise the temperature of the whole body by one degree (1K or 1deg C) is called its thermal capacity.

Thermal Equilibrium: When the two bodies in contact are at the same temperature and there is no flow of heat between them, these are said to be in thermal equilibrium.

Thermal Expansion: The increase in the size of an object on heating is called thermal expansion.

Thermometer: It is a device used for numerical measurement of temperature. The commonly used thermometer is mercury thermometer.

Time Period (of a wave): The time taken by a wave to travel through a distance equal to its wavelength is called its time period. It is denoted by T. Time period of a wave=1/frequency of the wave.

Time Period (of an oscillation): The time taken to complete one oscillation is called the time period of an oscillation.

Total internal reflection: Condition where all light is reflected back from a boundary between materials; occurs when light arrives at a boundary at the critical angle or beyond.

Transverse waves: A wave in which the particles of the medium oscillate in a direction perpendicular of the direction of propagation of wave is called the transverse wave.

Trough: The point of maximum negative displacement on a transverse wave is called a trough.

Ultrasonic: Sound waves too high in frequency to be heard by the human ear; frequencies above 20,000Hz.

Unbalanced forces: When a number of forces act on a body and the resultant force is not zero, then the forces are said to be unbalanced.

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Uniform Acceleration: When the velocity of a body increases by equal amounts in equal intervals of time it is said to have uniform acceleration.

Uniform Circular Motion: The motion of an object in a circular path with uniform speed is called uniform circular motion. Uniform circular motion is accelerated motion.

Uniform Speed: When a body travels equal distances in equal intervals of time then it is said to have uniform speed.

Uniform Velocity: When a body travels along a straight line in particular direction and covers equal distances in equal intervals of time it is said to have uniform velocity.

Van der Wall's force: General term for weak attractive intermolecular forces.

Vapor: The gaseous state of a substance that is normally in the liquid state.

Vector Quantity: A quantity, which needs both magnitude and direction to describe it, is called a vector quantity. Such a physical quantity should also follow the vector law of addition.

Vibration: A back and forth motion that repeats itself.

Virtual image: An image where light rays appear to originate from a mirror or lens; this image cannot be projected on a screen.

Volt: Unit of potential difference equivalent to joules/coulomb.

Watt: Metric unit for power; equivalent to joule/sec.

Wave mechanics: Alternate name for quantum mechanics derived from the wavelike properties of subatomic particles.

Wave motion: The movement of a disturbance produced in one part of a medium to another involving the transfer of energy but not the transfer of matter is called wave motion.

Wave period: The time required for two successive crests or other successive parts of the wave to pass a given point.

Wave velocity: The distance traveled by a wave in one second is called the wave velocity. The wave velocity of a wave depends upon the nature of the medium through which it passes.

Wave: A disturbance or oscillation that moves through a medium.

Wavelength: The distance between the two nearest points on a wave, which are in the same phase, is called the wavelength of the wave.

Weight: The force with which a body is attracted towards the center of the earth is called its weight. The SI unit of weight is N.

Weightlessness: The state when the apparent weight of a body becomes zero is called the state of weightlessness. All objects while falling freely under the action of gravity appear weightless.

Work: Work is done when force acting on a body displaces it. Work is a scalar quantity. The SI unit for work is Joule.

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