MRD-12th-121222 (A-II)

Total Time: 3:00 Hours

Mathematics (Part-II)

(New Course)

Total Marks: 100

Note: There are three sections in this paper i.e. A, B & C.

VERSION : C

Instructions:
- Please attempt Section-A on the MCQs Answer Sheet only.
- Only black ball point or marker may be used for shading the relevant circle.
- Please make sure that there is no cutting, over writing, erasing, or multiple circles shading.

Time Allowed: 20 Minutes

"Section-A"

Marks: 20

Q.1. Choose the correct option i.e. A, B, C or D.

1. P lies above the line if $ax_1 + by_1 + c$ 0
   (A) $>$ (B) $<$ (C) $=$ (D) $\leq$

2. A quantity having magnitude and direction is called ....
   (A) Vector (B) Scalar (C) Velocity (D) None

3. If $Z = ax^2 + 2hxy + by^2$ then $x\frac{\partial z}{\partial x} + y\frac{\partial z}{\partial y} = \cdots$
   (A) Z (B) $2Z$ (C) 0 (D) None

4. Slope of the line $2y + x + 3 = 0$ is .....
   (A) 2 (B) -2 (C) $-\frac{1}{2}$ (D) None

5. Two lines l_1 and l_2 are parallel if $m_1 - m_2 =$ .....
   (A) 0 (B) 1 (C) -1 (D) ∞

6. If the unknown function depends on more than one independent variable then the equation is called .....
   (A) P. D. E (B) P. D (C) D. E (D) O. D. E

7. The angle between two homogenous straight lines $y = m_1x$ and $y = m_2x$ is .....
   (A) $Tan\theta = \frac{2\sqrt{h^2 - ab}}{a+b}$ (B) $Tan\theta \frac{2\sqrt{ab - h^2}}{a+b}$ (C) $Tan\theta = \frac{2\sqrt{h^2 + ab}}{a+b}$ (D) None of these

8. $f(x,y) = \frac{\sqrt{y} + \sqrt{x}}{y + x}$ is homogenous function of degree .....
   (A) 1 (B) $-\frac{1}{2}$ (C) 2 (D) $\frac{1}{2}$

9. If $\vec{r} = 2\hat{\imath} + 3\hat{\jmath} + 4\hat{k}$ and $|\vec{r}| =$ .....
   (A) $\sqrt{29}$ (B) $\sqrt{30}$ (C) 5 (D) None of these

10. Equation the circle whose center is at origin and radius r is .....
    (A) $x^2 + y^2$ (B) $x^2 + y^2 = r^2$ (C) $x^2 - y^2 = r^2$ (D) None of these

11. The normal form of an equation is .....
    (A) $x\cos\theta + y\sin\theta = p$ (B) $x\cos\theta - y\sin\theta = p$ (C) $x\sin\theta + y\tan\theta = 0$ (D) $x\cos\theta - y\sin\theta = 0$

12. The Newton-Raphson method is also known as .....
    (A) Chord method (B) Second method (C) Diameter method (D) Tangent method

13. $\int \frac{dx}{\sqrt{a^2 - x^2}} =$ .....
    (A) $\ln\left|x + \sqrt{x^2 + a^2}\right| + c$ (B) $\sin^{-1}\frac{a}{x} + c$ (C) $\sin^{-1}\frac{x}{a} + c$ (D) None of these

14. If $e < 1$ than conic is known as .....
    (A) Parabola (B) Ellipse (C) Hyperbola (D) Circle

15. For vertical standard form of hyperbola $\frac{y^2}{a^2} - \frac{x^2}{b^2} = 1$, the asymptotes are the line .....
    (A) $y = \pm\frac{b}{a}x$ (B) $y = \pm\frac{a}{b}x$ (C) $(y-k) = \pm\frac{b}{a}(x-h)$ (D) None of these

16. $y^2 = 4px$ is the equation of .....
    (A) Ellipse (B) Parabola (C) Hyperbola (D) None of these

17. The process of finding anti-derivative is called .....
    (A) Differentiation (B) Integration (C) Probability (D) None of these

18. The graph of function f(x) is concave upward on interval (a, b) if .....
    (A) $f''(x) < 0$ (B) $f'(x) > 0$ (C) $f''(x) = 0$ (D) $f''(x) > 0$

19. The slope of vertical line is .....
    (A) Zero (B) Undefined (C) One (D) None of these

20. If $f(x,y) = \sin^{-1}xy$ then $fy =$ .....
    (A) $\frac{1}{\sqrt{1 - x^2y^2}}$ (B) $\frac{y}{\sqrt{1 - x^2y^2}}$ (C) $\frac{x}{\sqrt{1 - x^2y^2}}$ (D) None of these

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