

MARKING SCHEME
GENERAL MATHEMATICS 9TH
SECTION-A

Total Time: 20 minutes

Total Marks:15

1	2	3	4	5	6	7	8	9	10
C	A	C	B	A	A	B	A	B	A
11	12	13	14	15					
B	C	C	B	D					

Time: 2Hours 40 Minutes

SECTION-B

Total Marks: 36

Q1. Attempt any 9 of the following short questions. Each question carries equal marks.

- i. Hafsa got 84% of the total marks in her annual examination. If she had obtained 861 marks. Find out total marks in the examination?

Solution:

$$84\% \text{ of } x = 861$$

$$\frac{84}{100} \times x = 861$$

$$x = 861 \times \frac{100}{84}$$

$$x = 1025$$

1

1

1

1

- ii. Hafeez had trade goods worth Rs.175,000 and a cash amount of Rs. 90,000. If his wife possessed jewelry worth Rs. 84,000, find the amount of zakat payable by him?

Solution:

Value of trade goods=175,000

Cash amount= 90,000

Value of Jewelry = 84,000

Total amount =175,000+90,000+84,000

Total amount =349,000

1

1

Zakat Rate = 2.5% 1

Zakat Payable = 2.5% of 349,000

Zakat Payable = $\frac{1}{40} \times 349,000$ 1

Zakat Payable = 8725

- iii. Ali bought 8 dozen eggs at the rate of Rs. 70 per dozen. 6 eggs were found broken. He sold remaining eggs at the rate of Rs. 7 per egg. Find his profit or loss.

Solution:

Cost price = 70×8

Cost Price = 560 1

Total number of eggs = 8 dozen

Total number of eggs = 8×12

Total number of eggs = 96

Number of broken eggs = 6 1

Remaining eggs = $96 - 6$

Remaining eggs = 90

Sale price = 90×7 1

Sale price = 630

Sale Price > Cost Price

So, Profit has occurred

Profit = Sale Price - Cost Price 1

Profit = $630 - 560$

Profit = 70

- iv. Mr. Jawad deposits Rs. 90,000 in a Profit Loss Saving (PLS) account. If the profit rate is 12% then how much profit would he get after two months.

Solution:

Profit for one month = $\frac{\text{Principal Amount} \times \text{Rate of profit}}{12}$ 2

Profit for one month = $90,000 \times \frac{12}{100} \times \frac{1}{12}$ 1

Profit for one month = 900

Profit for two months = 900×2

Profit for two months = 1800

1

- v. If the worth of the property of a person is Rs. 5,000,000. How much tax would he pay at the rate of 5%.

Solution:

Total value of Property = 5,000,000

Tax Rate = 5%

Tax = Rate $\times$ Value of property

Tax = $5\% \times 5,000,000$

Tax = $\frac{5}{100} \times 5,000,000$

Tax = 250,000

1

1

1

1

- vi. Simplify: $\sqrt{\frac{X^a}{X^c}} \times \sqrt{\frac{X^c}{X^a}} \times \sqrt{\frac{X^a}{X^b}}$

Solution:

$$\sqrt{\frac{X^a}{X^c}} \times \sqrt{\frac{X^c}{X^a}} \times \sqrt{\frac{X^a}{X^b}} = \sqrt{X^a X^{-c}} \times \sqrt{X^c X^{-a}} \times \sqrt{X^a X^{-b}}$$

$$= \sqrt{X^a \cdot X^{-c} \times X^c \cdot X^{-a} \times X^a X^{-b}}$$

$$= \sqrt{X^a \cdot X^{-a} \times X^c \cdot X^{-c} \times X^b X^{-b}}$$

$$= \sqrt{X^{a-a} \cdot X^{c-c} \cdot X^{b-b}}$$

$$= \sqrt{X^0 \times X^0 \times X^0}$$

$$= \sqrt{1 \times 1 \times 1}$$

$$= \sqrt{1}$$

$$= \pm 1$$

1

1

1

1

- vii. $\log_8 x = \frac{4}{3}$

Solution:

$$\log_8 x = \frac{4}{3}$$

$$\therefore \log_a y = x$$

2

$$\therefore y = a^x$$

$$\left. \begin{array}{l} x = 8^{\frac{4}{3}} \\ x = (2^3)^{\frac{4}{3}} \\ x = 2^4 \\ x = 16 \end{array} \right\} \begin{array}{l} \leftarrow (1) \\ \leftarrow (1) \end{array}$$

viii. Find the 12th term of an Arithmetic Progression (AP)

18, 15, 12, 9, ...

Solution:

$$\left. \begin{array}{l} a_1 = 18 \\ d = 15 - 18 \\ d = -3 \\ a_{12} = ? \end{array} \right\} \leftarrow (1)$$

Since,

$$a_n = a_1 + (n - 1)d \leftarrow (2)$$

$$\left. \begin{array}{l} a_{12} = 18 + (12 - 1)(-3) \\ a_{12} = 18 + (11)(-3) \\ a_{12} = 18 - 33 \\ a_{12} = -15 \end{array} \right\} \leftarrow (1)$$

ix. Find three geometric means between $\frac{1}{27}$ and 3.

Solution:

Let G_1, G_2, G_3 be 3 Geometric means between $\frac{1}{27}$ and 3.

Then,

$\frac{1}{27}, G_1, G_2, G_3, 3$ are in Geometric mean.

$$a_1 = a = \frac{1}{27}, n=5, a_n = 3, r=?$$

Then,

$$\begin{aligned}
 a_n &= a_1 r^{n-1} \\
 3 &= \frac{1}{27} r^{5-1} \\
 3 &= \frac{1}{27} r^4 \\
 3 \times 27 &= r^4 \\
 81 &= r^4 \\
 (3)^4 &= (r)^4
 \end{aligned}$$

So,

$$r=3$$

2

Therefore,

$$\begin{aligned}
 G_1 &= ar = \frac{1}{27} \times 3 = \frac{1}{9} \\
 G_2 &= ar^2 = \frac{1}{9} \times 3 = \frac{1}{3} \\
 G_3 &= ar^3 = \frac{1}{3} \times 3 = 1
 \end{aligned}$$

1

Hence,

$\frac{1}{9}, \frac{1}{3}$ and 1 are 3 Geometric mean between $\frac{1}{27}$ and 3.

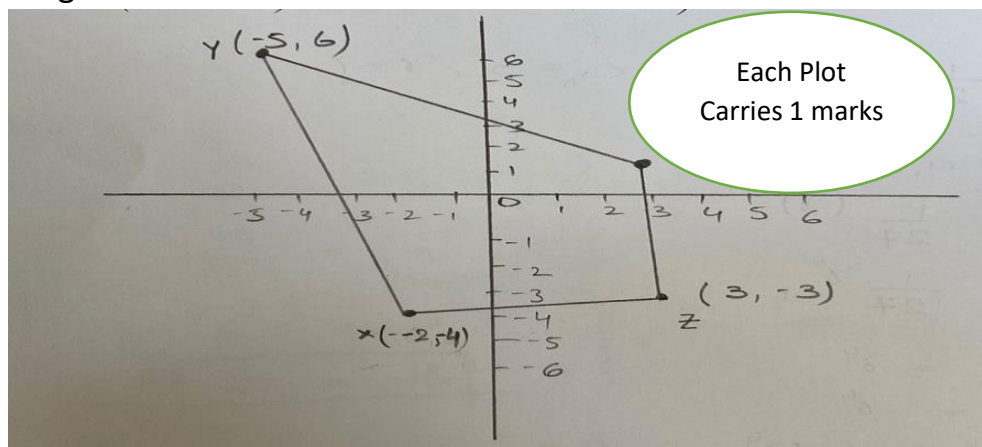
- x. Plot the points W, X, Y and Z in the XY plane: W (3,1), X (-2, -4), Y (-5,6), Z (3, -3).

Solution:

W (3, 1) , X(-2,-4)

Y (-5, 6) , Z(3, -3)

Diagram:



- xi. Salam has a post-paid connection. Last month he consumed a total of 3 hours and 20 minutes time for calls. If per 30 seconds call charges is Rs.0.50, then what was his bill?

Solution:

Consumed time= 3hrs and 20 minutes

Consumed time in minutes= 200 minutes

Call charges per 30 seconds =Rs.0.5

Call Charges per minute= Rs.1.0

Cost of 200 minutes=Rs.200

Line Rent=Rs. 499

Line Rent= Rs. 699

- xii. If $X = \{1, 2, 3\}$ and $Y = \{4, 5, 6\}$, Write an ONTO function from X to Y.

Solution:

$$X = \{1, 2, 3\}$$

$$Y = \{4, 5, 6\}$$

$$X \times Y = \{(1,4), (1,5), (1,6), (2,4), (2,5), (2,6), (3,4), (3,5), (3,6)\}$$

$$R = \{(1,4), (2, 5), (3, 6)\}$$

$$\text{Domain} = \{1, 2, 3\}$$

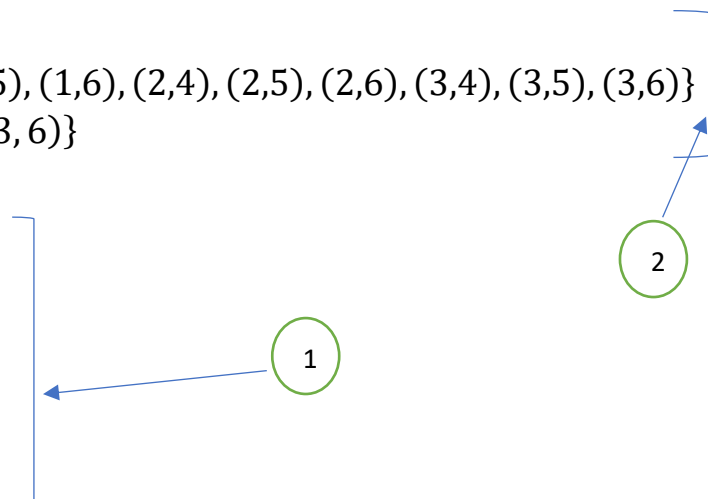
$$\text{Domain} = X$$

So, R is a function

$$\text{Range} = \{4,5,6\}$$

$$\text{Range} = Y$$

So, R is onto function from X to Y.



Section-C

Total Marks:24

Q2. 10 men take 12 hours to spray insecticides on fruit trees spread over 40 hectares. How many men will be required to spray 32 hectares area in 8 hours?

Solution:

Men
10 ↓
x
10:x

HOURS
12 ↑
8
8:12 → ①

1

Men
10 ↓
x
10:x

Area
40 ↑
32
40:32 → ②

1

Taking Compound Proportion

10:x
10:x

8:12
40:32

2

Product of means = Product of Extremes

$$x \times 8 \times 40$$

$$x = \frac{10 \times 12 \times 32}{8 \times 40}$$

$$x = 12$$

$$10 \times 12 \times 32$$

2

Q3. Draw the graph of equation:

$$3x + y = 6$$

Solution:

$$3x + y = 6$$

$$y = 6 - 3x$$

1

1

X	0	1	2	-1	-2
y	6	3	0	9	12

Using

$$y = 6 - 3x$$

Put $x=0$

$$y=6-3(0)$$

$$y=6-0$$

$$y=6$$

1

Put $x=1$

$$y=6-3(1)$$

$$y=6-3$$

$$y=3$$

1

Put $x=-1$

$$y=6-3(-1)$$

$$y=6+3$$

$$y=9$$

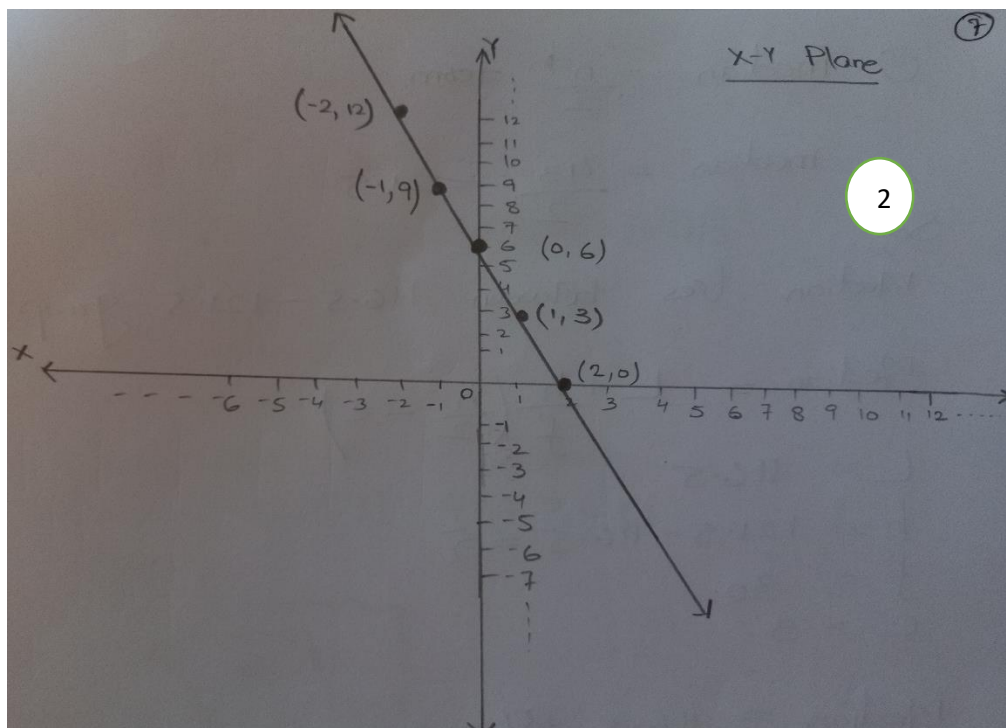
1

Put $x=-2$

$$y=6-3(-2)$$

$$y=6+6$$

$$y=12; (-2,12)$$



Q4. From the following distribution

Daily Wages (In Rupees)	112 – 116	117 – 121	122 – 126	127 – 131	132 - 136
Number of Workers	3	20	11	4	5

- Construct a table.
- Find the class boundaries for each group
- Calculate Median wages.

Solution:

3

Class limits	Frequency	Class Boundaries	Cumulative Frequency
112-116	3	111.5-116.5	3
117-121	20	116.5-121.5	33+20=23
122-126	11	121.5-126.5	23+11=34
127-131	4	126.5-131.5	34+4=38
132-136	5	131.5-136.5	38+5=43
	$\Sigma f = 43$		

$$\text{Median} = \frac{n^{\text{th}} \text{term}}{2}$$

$$\text{Median} = \frac{43}{2} = 21.5$$

So,

Median Lies between 116.5-121.5 group

$$\text{Median} = l + \frac{h}{f} \left(\frac{n}{2} - c \right)$$

$$l = 116.5$$

$$h = 121.5 - 116.5 = 5$$

$$f = 30$$

$$c = 3$$

$$\text{Median} = 116.5 + \frac{5}{20} (21.5 - 3)$$

3

$$\text{Median} = 116.5 + 0.25(18.5)$$

$$\text{Median} = 116.5 + 4.625$$

$$\text{Median} = 121.125$$

Q5. If $U = \{1, 2, 3, 4, 5, 6, 7\}$, $A = \{1, 2, 3\}$, $B = \{3, 4, 5\}$. Then with the help of Venn diagram verify De Morgan's Law:

$$(A \cup B)' = A' \cap B'$$

Solution:

$$\text{L.H.S} = (A \cup B)'$$

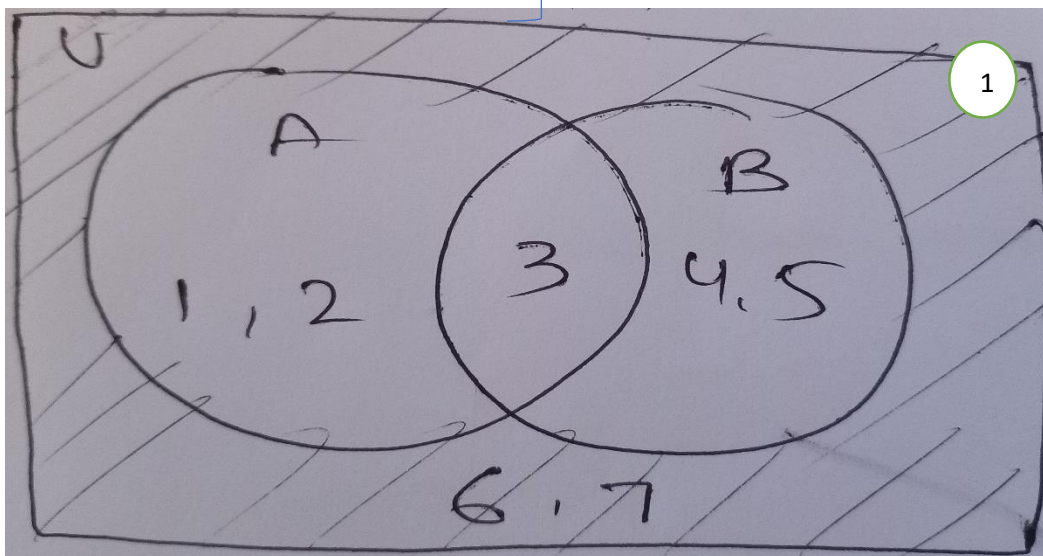
$$A \cup B = \{1, 2, 3\} \cup \{3, 4, 5\}$$

$$A \cup B = \{1, 2, 3, 4, 5\}$$

$$(A \cup B)' = U - (A \cup B)$$

$$= \{1, 2, 3, 4, 5, 6, 7\} - \{1, 2, 3, 4, 5\}$$

$$= \{6, 7\}$$



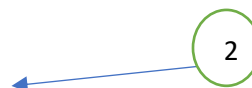
$$\text{R.H.S} = A' \cap B'$$

$$A' = U - A$$

$$A' = \{1, 2, 3, 4, 5, 6, 7\} - \{1, 2, 3\}$$

$$A' = \{4, 5, 6, 7\}$$

$$B' = U - B$$



$$B' = \{1,2,3,4,5,6,7\} - \{3,4,5\}$$

$$B' = \{1,2,6,7\}$$

$$A' \cap B' = \{4,5,6,7\} \cap \{1,2,6,7\}$$

$$A' \cap B' = \{6,7\}$$

