BOARD QUESTION PAPER: JULY 2023

Mathematics Part - I

Time: 2 Hours **Max. Marks: 40**

Note: i. *All* questions are compulsory.
ii. Use of a calculator is not allowed.
iii. The numbers to the right of the questions indicate full marks.
iv. In case of MCQs [Q. No. 1(A)] only the first attempt will be evaluated and will be given credit.
v. For every MCQ, four alternatives (A), (B), (C), (D) of answers are given. Alternative of correct answer is to be written in front of the subquestion number.

Q.1. (A) Choose the correct answer and write the alphabet of it in front of the subquestion number: **[4]**

i. Sum of first five multiples of 3 is _____
(A) 45 (B) 55
(C) 15 (D) 75

ii. Find the value of determinant $\begin{vmatrix} 3 & 2 \\ 4 & 5 \end{vmatrix}$:
(A) 2 (B) 7 (C) −7 (D) 23

iii. Which of the following quadratic equations has roots 3 and 5?
(A) $x^2 - 15x + 8 = 0$ (B) $x^2 - 8x + 15 = 0$
(C) $x^2 + 3x + 5 = 0$ (D) $x^2 + 8x - 15 = 0$

iv. Two coins are tossed simultaneously. Write the number of sample points n(S):
(A) 2 (B) 8 (C) 4 (D) 6

(B) Solve the following subquestions: **[4]**

i. If $15x + 17y = 21$ and $17x + 15y = 11$, then find the value of $x + y$.

ii. Given sequence is an A.P. Find the next two terms of this A.P.:
5, 12, 19, 26, ……...

iii. On certain article if rate of CGST is 9%, then what is the rate of SGST and what is the rate of GST?

iv. If n(S) = 2 and n(A) = 1, then find P(A).

Q.2. (A) Complete the following activity and rewrite (any *two*): **[4]**

i. Complete the following table to draw the graph of the equation $x + y = 3$:

x	3	☐	☐
y	☐	5	3
(x, y)	(3, 0)	☐	(0, 3)

ii. Complete the following activity to find the value of discriminant of the equation $x^2 + 10x - 7 = 0$.

Solution:

Comparing $x^2 + 10x - 7 = 0$ with $ax^2 + bx + c = 0$

$a = 1, b = 10, c =$ ☐

$\therefore \quad b^2 - 4ac =$ ☐ $- 4 \times 1 \times (-7)$

$= 100 +$ ☐

$\therefore \quad =$ ☐

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iii. Complete the following table using given information:

Sr. No.	FV	Share is at	MV
1.	₹ 10	Premium of ₹ 7	☐
2.	₹ 25	☐	₹ 16
3.	₹ 300	☐	₹ 315
4.	☐	at par	₹ 5

(B) Solve the following subquestions (any *four*): **[8]**

i. Solve the following simultaneous equations:
$x + y = 6; x - y = 4$

ii. Solve the following quadratic equation by factorisation method:
$x^2 + 15x + 54 = 0$

iii. The first term a = 8 and common difference d = 5 are given. Write an A.P.

iv. Mr. Rohit is a retailer. He paid GST of ₹ 6,500 at the time of purchase. He collected GST of ₹8,000 at the time of sale.
(a) Find his input tax and output tax.
(b) What is his input tax credit?
(c) Find his payable GST.
(d) Hence find the payable CGST and payable SGST.

v. Find the mean from the given values:
$\sum x_i f_i = 1265; N = 50$

Q.3. (A) Complete the following activity and rewrite (any *one*): **[3]**

i. Smita has invested ₹ 12,000 and purchased shares of FV ₹ 10 at a premium of ₹ 2. Find the number of shares she purchased. Complete the given activity to get the answer.

Solution:

FV = ₹ 10, Premium = ₹ 2

$\therefore$ MV = FV + ☐ = 10 + ☐ = ☐

$\therefore$ Number of shares = $\frac{\text{Total investment}}{\text{MV}} = \frac{12,000}{\square}$

= ☐ shares

Ans. Smita has purchased ☐ shares.

ii. If one die is rolled once, then find the probability of each of the following events:
(a) Number on the upper face is prime.
(b) Number on the upper face is even.

Solution:

'S'is the sample space

S = {1, 2, 3, 4, 5, 6} $\therefore$ n(S) = ☐

(a) Event A : Prime number on the upper face

A = {2, 3, 5} $\therefore$ n(A) = ☐

$$P(A) = \frac{n(A)}{n(S)}$$

$\therefore$ $P(A) = \frac{3}{\square} =$ ☐

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(b) Event B : Even number on the upper face

$B = \{2, 4, 6\}$ $\therefore n(B) =$ ☐

$P(B) = \frac{n(B)}{n(S)}$

$\therefore P(B) =$ ☐ $= \frac{1}{2}$

(B) Solve the following subquestions (any *two*): **[6]**

i. Two numbers differ by 3. The sum of the twice the smaller number and thrice the greater number is 19. Find the numbers.

ii. Solve the given quadratic equation by using formula method: $5x^2 + 13x + 8 = 0$

iii. A balloon vendor has 2 red, 3 blue and 4 green balloons. He wants to choose one of them at random to give it to Pranali. What is the probability of the event that Pranali gets:

(a) a red balloon

(b) a blue balloon

(c) a green balloon.

iv. The following table shows the number of students of class X and the time they utilized daily for their studies. Find the mean time spent by 50 students for their studies by direct method:

Time (hrs.)	No. of students
0 – 2	7
2 – 4	18
4 – 6	12
6 – 8	10
8 – 10	3

Q.4. Solve the following subquestions (any *two*): **[8]**

i. The sum of two roots of a quadratic equation is 5 and sum of their cubes is 35, find the equation.

ii. If p times the p^{th} term of an A.P. is equal to q times q^{th} term, then show that $(p + q)^{th}$ term of that A.P. is zero $(p \neq q)$.

iii. Draw a pie diagram to represent the world population given in the following table :

Country	Japan	England	India	China
Percentage of World Population	20	10	40	30

Q.5. Solve the following subquestions (any *one*): **[3]**

i. Represent the following data using histogram:

Daily Income (₹)	No. of Workers
130 – 135	4
135 – 140	7
140 – 145	14
145 – 150	16

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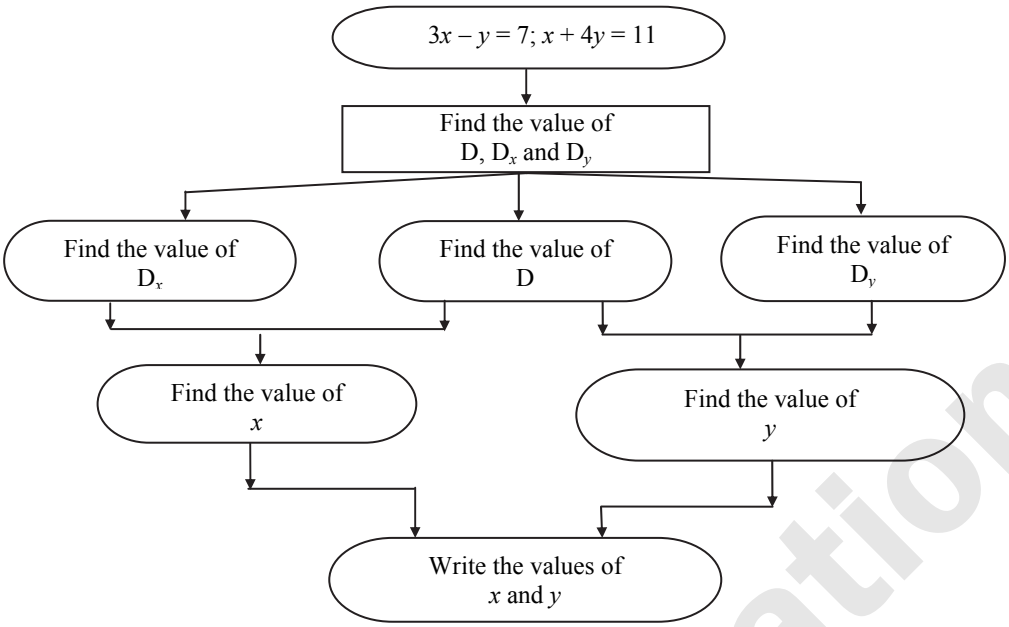
ii. Observe the following flow chart and solve it:



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