



# BOARD QUESTION PAPER: MARCH 2023

## Mathematics Part - I

Time: 2 Hours

Max. Marks: 40

Note:

- All questions are compulsory.
- Use of a calculator is not allowed.
- The numbers to the right of the questions indicate full marks.
- In case of MCQs [Q. No. 1(A)] only the first attempt will be evaluated and will be given credit.
- 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]

- To draw the graph of  $4x + 5y = 19$ , find  $y$  when  $x = 1$ :  
(A) 4 (B) 3 (C) 2 (D) -3
- Out of the following equations which one is *not* a quadratic equation?  
(A)  $x^2 + 4x = 11 + x^2$  (B)  $x^2 = 4x$   
(C)  $5x^2 = 90$  (D)  $2x - x^2 = x^2 + 5$
- For the given A.P.  $a = 3.5$ ,  $d = 0$ , then  $t_n =$  \_\_\_\_\_  
(A) 0 (B) 3.5 (C) 103.5 (D) 104.5
- If  $n(A) = 2$ ,  $P(A) = \frac{1}{5}$ , then  $n(S) = ?$   
(A) 10 (B)  $\frac{5}{2}$  (C)  $\frac{2}{5}$  (D)  $\frac{1}{3}$

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

- Find the value of the following determinant:  
$$\begin{vmatrix} 4 & 3 \\ 2 & 7 \end{vmatrix}$$
- Find the common difference of the following A.P.:  
2, 4, 6, 8, ...
- On certain article if rate of CGST is 9%, then what is the rate of SGST?
- If one coin is tossed, write the sample space 'S'.

**Q.2. (A) Complete any two given activities and rewrite it:** [4]

- Complete the following activity; find the value of  $x$ :  
 $5x + 3y = 9$  ... (I)  
 $2x - 3y = 12$  ... (II)  
Add equations (I) and (II)  
 $5x + 3y = 9$   
 $+ 2x - 3y = 12$

$$7x = \boxed{\phantom{00}}$$

$$x = \boxed{\phantom{00}}$$

$$x = \boxed{\phantom{00}}$$



- ii. Complete the following activity to determine the nature of the roots of the quadratic equation  $x^2 + 2x - 9 = 0$ :

**Solution:**

Compare  $x^2 + 2x - 9 = 0$  with  $ax^2 + bx + c = 0$

$a = 1, b = 2, c = \square$

$\therefore b^2 - 4ac = (2)^2 - 4 \times \square \times \square$

$\Delta = 4 + \square = 40$

$\therefore b^2 - 4ac > 0$

$\therefore$  The roots of the equation are real and unequal.

- iii. Complete the following table using given information:

Sr. No.	FV	Share is at	MV
1.	₹ 100	Par	<input type="text"/>
2.	<input type="text"/>	Premium ₹ 500	₹ 575
3.	₹ 10	<input type="text"/>	₹ 5
4.	₹ 200	Discount ₹ 50	<input type="text"/>

**(B) Solve the following subquestions (any four):**

[8]

- Solve the following simultaneous equations:  
 $x + y = 4; 2x - y = 2$
- Write the following equation in the form  $ax^2 + bx + c = 0$ , then write the values of a, b, c:  
 $2y = 10 - y^2$ .
- Write an A.P. whose first term is  $a = 10$  and common difference  $d = 5$ .
- Courier service agent charged total ₹ 590 to courier a parcel from Nashik to Nagpur. In the tax invoice taxable value is ₹ 500 on which CGST is ₹ 45 and SGST is ₹ 45. Find the rate of GST charged for this service.
- Observe the following table and find Mean:

**Assumed mean  $A = 300$**

Class	Class mark $x_i$	$d_i = x_i - A$ $d_i = x_i - 300$	Frequency $f_i$	Frequency $\times$ Deviation $f_i d_i$
200 - 240	220	-80	5	-400
240 - 280	260	-40	10	-400
280 - 320	300 $\rightarrow A$	0	15	0
320 - 360	340	40	12	480
360 - 400	380	80	8	640
Total			$\Sigma f_i = 50$	$\Sigma f_i d_i = 320$

**Q.3. (A) Complete any one activity and rewrite it:**

[3]

- Form a 'Road Safety Committee' of two, from 2 boys ( $B_1, B_2$ ) and 2 girls ( $G_1, G_2$ ). Complete the following activity to write the sample space:
  - Committee of 2 boys =  $\{\square\}$
  - Committee of 2 girls =  $\{\square\}$
  - Committee of one boy and one girl =  $\{B_1G_1, B_1G_2, \square, \square\}$
  - $\therefore$  Sample space (S) =  $\{(B_1B_2), (B_1G_1), \square, \square, (B_2G_2), (G_1G_2)\}$



- ii. Fill in the boxes with the help of given information:

Tax invoice of services provided (Sample)								
Food Junction, Khed-Shivapur, Pune						Invoice No. 58		
Mob. No. 7588580000, email-ahar.khed@yahoo.com								
GSTIN : 27AAAAA5555B1ZA				Invoice Date : 25 Feb., 2020				
SAC	Food items	Qty	Rate (in ₹)	Taxable amount	CGST		SGST	
9963	Coffee	1	20	20.00	2.5 %	₹ 0.50	2.5 %	<input type="text"/>
9963	Masala Tea	1	10	10.00	<input type="text"/>	₹ 0.25	2.5 %	<input type="text"/>
9963	Masala Dosa	2	60	<input type="text"/>	2.5%	<input type="text"/>	2.5%	₹ 3.00
			Total	150.00		<input type="text"/>		₹ 3.75
Grand Total							= ₹ 157.50	

**(B) Solve the following subquestions (any two):**

[6]

- Solve the following simultaneous equations using Cramer's rule:  
 $4m + 6n = 54$ ;  $3m + 2n = 28$
- Solve the following quadratic equation by formula method:  
 $x^2 + 10x + 2 = 0$
- A two digit number is formed with digits 2, 3, 5, 7, 9 without repetition. What is the probability of the following events?  
**Event A:** The number formed is an odd number.  
**Event B:** The number formed is a multiple of 5.
- The frequency distribution table shows the number of mango trees in a grove and their yield of mangoes. Find the median of data:

No. of Mangoes	No. of Trees
50 – 100	33
100 – 150	30
150 – 200	90
200 – 250	80
250 – 300	17

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

[8]

- If the first term of an A.P. is  $p$ , second term is  $q$  and last term is  $r$ , then show that sum of all terms is  $(q + r - 2p) \times \frac{(p + r)}{2(q - p)}$ .
- Show the following data by a frequency polygon:

Electricity bill (₹)	Families
200 – 400	240
400 – 600	300
600 – 800	450
800 – 1000	350
1000 – 1200	160

- The sum of the squares of five consecutive natural numbers is 1455. Find the numbers.

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

[3]

- Draw the graph of the equation  $x + 2y = 4$ . Find the area of the triangle formed by the line intersecting on X-axis and Y-axis.
- A survey was conducted for 180 people in a city. 70 ate Pizza, 60 ate burgers and 50 ate chips. Draw a pie diagram for the given information.