

MATHS - I

BOARD QUESTION PAPER: DECEMBER 2020

Time: 2 Hours

Total 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 MCQ's (Q. No. 1(A)) only the first attempt will be evaluated and will be given credit.
- v. For every MCQ, the correct alternative (A), (B), (C) or (D) with sub-question number is to be written as an answer.

Q.1. (A) Four alternative answers are given for every sub-question. Choose the correct alternative and write its alphabet with sub-question number: [4]

i. To draw graph of $4x + 5y = 19$, what will be the value of y when $x = 1$:

- (A) 4 (B) 3
(C) 2 (D) -3

ii. What is the sum of the first 10 natural numbers?

- (A) 55 (B) 20
(C) 65 (D) 11

iii. From the following equations, which one is the quadratic equation?

- (A) $\frac{5}{x} - 3 = x^2$ (B) $x(x + 5) = 2$
(C) $n - 1 = 2n$ (D) $\frac{1}{x^2}(x + 2) = x$

iv. In the format of GSTIN there are _____ alpha-numerals.

- (A) 9 (B) 10
(C) 16 (D) 15

(B) Solve the following subquestions: [4]

i. For simultaneous equations in variable x and y , if $D_x = 25$, $D_y = 40$, $D = 5$, then what is the value of x ?

ii. Find the first term and common difference for the following A.P.:
127, 135, 143, 151, ...

iii. A die is rolled then write sample space 'S' and number of sample point $n(S)$.

iv. If $\sum f_i d_i = 108$ and $\sum f_i = 100$, then find $\bar{d} = ?$

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

i. Activity:

$$\begin{vmatrix} 3 & 2 \\ 4 & 5 \end{vmatrix} = 3 \times \boxed{} - \boxed{} \times 4 \\ = \boxed{} - 8 \\ = \boxed{}$$

ii. One of the roots of quadratic equation $5m^2 + 2m + k = 0$ is $-\frac{7}{5}$.

Complete the following activity to find the value of k .

Activity:

$-\frac{7}{5}$ is a root of quadratic equation

$$5m^2 + 2m + k = 0$$

Put $m = \square$ in the equation

$$\therefore 5 \times \left(-\frac{7}{5}\right)^2 + 2 \times \square + k = 0$$

$$\therefore \square + \left(-\frac{14}{5}\right) + k = 0$$

$$\therefore k = \square$$

- iii. Complete the activity to prepare a table showing the co-ordinates which are necessary to draw a frequency polygon:

Class	18 – 19	19 – 20	20 – 21	<input type="text"/>
Class Mark	18.5	19.5	<input type="text"/>	21.5
Frequency	4	<input type="text"/>	15	19
Co-ordinates of point	<input type="text"/>	(19.5, 13)	(20.5, 15)	(21.5, 19)

(B) Solve the following sub-questions (any four):

[8]

- Sum of two numbers is 7 and their difference is 5. Find the numbers.
- Solve the quadratic equation by factorisation method:
 $x^2 + x - 20 = 0$
- Find the 19th term of the following A.P.:
7, 13, 19, 25,
- For the following experiments, write sample space 'S' and number of sample points n(S):
Two digit numbers are formed using digits 2, 3 and 5 without repeating a digit.
- The following table shows causes of noise pollution. Find the measure of central angles for each, to draw a pie diagram:

Construction	Traffic	Aircraft take offs	Industry
10%	50%	15%	25%

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

[3]

- In an A.P. the first term is -5 and last term is 45 . If sum of 'n' terms in the A.P. is 120 , then complete the activity to find n.

Activity:

$$t_1 = -5, t_n = \square, S_n = \square$$

$$S_n = \frac{n}{2} [t_1 + \square]$$

$$\square = \frac{n}{2} [-5 + 45]$$

$$240 = n \times \square$$

$$\therefore n = \square$$

- A card is drawn from a well shuffled pack of 52 playing cards. Complete the activity to find the probability of the event that the card drawn is a red card.

Activity:

'S' is the sample space.

$$n(S) = 52$$

Event A: Card drawn is a red card.

Total number of red cards = hearts + diamonds

$$\therefore n(A) = \square$$

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

$$\therefore P(A) = \frac{\boxed{}}{52}$$

$$\therefore P(A) = \boxed{}$$

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

[6]

- Solve the following simultaneous equations graphically:
 $x + y = 5$; $x - y = 1$.
- Solve quadratic equation using formula method:
 $5m^2 + 13m + 8 = 0$.
- A retailer sold 2 tins of lustre paint and taxable value of each tin is ₹ 2,800. If the rate of GST is 28%, then find the amount of CGST and SGST charged in the tax invoice.
- Time allotted for the preparation of an examination by some students is shown in the table. Draw a histogram to show this information:

Time (minutes)	No. of Students
60-80	14
80-100	20
100-120	24
120-140	22

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

[8]

- If one root of the quadratic equation $ax^2 + bx + c = 0$ is half of the other root, show that,
 $b^2 = \frac{9ac}{2}$.
- Bhujangrao invested ₹ 2,50,590 in shares of F.V. ₹ 10 when M.V. is ₹ 250. Rate of brokerage is 0.2% and GST is 18%, then find:
 - the number of shares purchased,
 - the amount of brokerage paid, and
 - GST paid for the trading.
- The following table shows frequency distribution of number of trees planted by students in the school:

No. of Trees Planted	No. of Students
0-10	30
10-20	70
20-30	100
30-40	70
40-50	40

Find the mode of trees planted.

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

[3]

- Six faces of a die are as shown below:



If the die is rolled once, find the probability of event 'M' that 'English vowel appears on upper face'.

- Construct any one linear equation in two variables. Obtain another equation by interchanging only coefficients of variables. Find the value of the variables.