BOARD QUESTION PAPER: JULY 2020
Maths - I

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

Notes:
i.   *All* questions are compulsory.
ii.   Use of 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) $\dfrac{5}{x} - 3 = x^2$ (B) $x(x + 5) = 2$ (C) $n - 1 = 2n$ (D) $\dfrac{1}{x^2}(x + 2) = x$

iv.   In the format of GSTIN there are _____ alpha-numerals.
       (A)   9   (B)   10   (C)   16   (D)   15

Q.1. (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 $-\dfrac{7}{5}$.

       Complete the following activity to find the value of k.
       Activity:
       $-\dfrac{7}{5}$ is a root of quadratic equation

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

Put m = ☐ in the equation

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

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

$$\therefore \quad k = \boxed{}$$

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	☐
Class Mark	18.5	19.5	☐	21.5
Frequency	4	☐	15	19
Co-ordinates of point	☐	(19.5, 13)	(20.5, 15)	(21.5, 19)

Q.2. (B) **Solve the following sub-questions (any four):** **[8]**

i. Sum of two numbers is 7 and their difference is 5. Find the numbers.

ii. Solve the quadratic equation by factorisation method:
$x^2 + x - 20 = 0$

iii. Find the 19th term of the following A.P.:
7, 13, 19, 25, …….. .

iv. 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.

v. 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]**

i. 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:

$$t_1 = -5, \ t_n = \boxed{}, \ S_n = \boxed{}$$

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

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

$$240 = n \times \boxed{}$$

$$\therefore \quad n = \boxed{}$$

ii. 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

$$\therefore \quad n(A) = \boxed{}$$

$$p(A) = \frac{\boxed{}}{n(S)}$$

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

$$\therefore \quad p(A) = \boxed{}$$

Q.3. (B) Solve the following subquestions (any two): **[6]**

i. Solve the following simultaneous equations graphically:
   $x + y = 5; x - y = 1$.

ii. Solve quadratic equation using formula method:
   $5m^2 + 13m + 8 = 0$.

iii. 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.

iv. 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]**

i. If one root of the quadratic equation $ax^2 + bx + c = 0$ is half of the other root, show that,
   $b^2 = \dfrac{9ac}{2}$.

ii. 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:
   a. the number of shares purchased,
   b. the amount of brokerage paid, and
   c. GST paid for the trading.

iii. 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]**

i. Six faces of a die are as shown below:

A	B	C	D	E	O

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

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