BOARD QUESTION PAPER : MARCH 2018

ALGEBRA

Time: 2 Hours **Total Marks: 40**

Note:

i. *All* questions are compulsory.

ii. Use of calculator is not allowed.

Q.P. SET CODE

B

1. Attempt any *five* of the following subquestions: **[5]**

i. Find next two terms of an A.P. 4, 9, 14,.....

ii. State whether the given equation is quadratic or not. Give reason.

$\frac{5}{4}\ m^2 - 7 = 0.$

iii. If $D_x = 25$, $D = 5$ are the values of the determinants for certain simultaneous equations in x and y, find x.

iv. If $S = \{2, 4, 6, 8, 10, 12\}$ and $A = \{4, 8, 12\}$, find A'.

v. Write any one solution of equation $x + 2y = 7$.

vi. If $S_5 = 15$ and $S_6 = 21$, find t_6.

2. Attempt any *four* of the following subquestions: **[8]**

i. Find 'n' if the nth term of the following A.P. is 66: 3, 6, 9, 12, ...

ii. If one of the roots of the quadratic equation $x^2 - 7x + k = 0$ is 4, then find the value of k.

iii. A box contains 20 cards marked with numbers 1 to 20. One card is drawn at random. Write the event A using the number on the card is multiple of 4. Write S, n(S), A and n(A).

iv. Find the value of $x - y$ if $3x + 2y = 15$, $2x + 3y = 10$.

v. Form the quadratic equation if its roots are 3 and –4.

vi. For a certain frequency distribution, the values of mean and median are 72 and 78 respectively. Find the value of mode.

3. Attempt any *Three* of the following subquestions: **[9]**

i. For an A.P., find S_{10} if $a = 6$ and $d = 3$.

ii. Solve the following quadratic equation by using formula method: $3q^2 - 2q = 8$.

iii. Solve the following simultaneous equations using Cramer's rule:
$4x + 3y = 18$; $3x - 2y = 5$.

iv. A die is thrown, find the probability of the event of getting an odd number.

v. The marks obtained by a student in an examination are given below. The total marks out of 100 obtained in various subjects are as follows:

Subject	Marks
Marathi	75
English	85
Science	100
Mathematics	100
Total	360

Represent the above data using pie diagram.

4. Attempt any *two* of the following subquestions: **[8]**

i. If $\alpha + \beta = 5$ and $\alpha^3 + \beta^3 = 35$, find the quadratic equation whose roots are α and β.

ii. Two dice are thrown. Find the probability of getting:

(a) The sum of the numbers on their upper faces is at least 9.

(b) The sum of the numbers on their upper faces is 15.

(c) The number of the upper face of the second die is greater than the number on the upper face of the first die.

iii. Frequency distribution of daily commission received by 100 salemen is given below:

Daily Commission (in Rs.)	No. of Salesmen
100 – 120	20
120 – 140	45
140 – 160	22
160 – 180	09
180 – 200	04

Find mean daily commission received by salesmen, by assumed mean method.

5. Attempt any *two* of the following subquestions: **[10]**

i. A boat takes 10 hours to travel 30 km upstream and 44 km downstream, but it takes 13 hours to travel 40 km upstream and 55 km downstream. Find the speed of the boat in still water and the speed of the stream.

ii. If the 9^{th} term of an A.P. is zero, then prove that 29^{th} term is double of 19^{th} term.

iii. Draw histrogram and frequency polygon on the same graph paper for the following frequency distribution:

Class	Frequency
15 – 20	20
20 – 25	30
25 – 30	50
30 – 35	40
35 – 40	25
40 – 45	10