

# BOARD QUESTION PAPER : JULY 2016

## ALGEBRA

**Time: 2 Hours**

**Max. Marks: 40**

**Note:**

- i. All questions are compulsory.
- ii. Use of calculator is not allowed.

**1. Solve any five of the following subquestion:**

**[5]**

- i. If  $3x + 2y = 10$  and  $2x + 3y = 15$ , then find the value of  $x + y$ .
- ii. Find the common difference of the A. P. 3, 5, 7, .....
- iii. Two coins are tossed simultaneously. Write the sample space S.
- iv. Write the following quadratic equation in standard form  $ax^2 + bx + c = 0$  :  $x(x + 3) = 7$ .
- v. If  $\sum f_i = 25$  and  $\sum f_i x_i = 100$ , then find the mean  $(\bar{x})$ .
- vi. Find the value of a, b, c in the following quadratic equation:  $2x^2 + 18 = 6x$ .

**2. Attempt any four of the following subquestions:**

**[8]**

- i. Find the eighteenth term of the A.P.: 1, 7, 13, 19,.....
- ii. Form the quadratic equation if the roots are 3 and 8.
- iii. Solve the following simultaneous equations using Cramer's rule:  
 $4x + 3y = 4$   
 $6x + 5y = 8$
- iv. In the following experiment write the sample space S, Number of sample points n(S), write the event P in set form and find n(P) :  
 Form two digit number using the digits 0, 1, 2, 3, 4, without repeating the digits, P is the event, that the number so formed is even.
- v. For a certain frequency distribution, the value of mean and mode are 54.6 and 54 respectively. Find the value of median.
- vi. Subjectwise marks obtained by a student in an examination are given below:

Subject	Marks
Marathi	85
English	90
Science	85
Mathematics	100
Total	360

Draw a pie diagram to represent the above data.

**3. Attempt any three of the following subquestions :**

**[9]**

- i. Represent the following data by histogram:

Price of sugar Per kg (in ₹)	Number of Weeks
28 – 30	4
30 – 32	8
32 – 34	22
34 – 36	12
36 – 38	6

- ii. A coin is tossed three times then find the probability of the following events:  
 A is an event of getting a head on middle coin.  
 B is an event of getting exactly one tail.

- iii. The following table shows ages of 300 patients getting medical treatment in a hospital on a particular day:

Age (in years)	No. of Patients
10 – 20	60
20 – 30	42
30 – 40	55
40 – 50	70
50 – 60	53
60 – 70	20

Find the median age of patient.

- iv. Solve the following quadratic equation by using formula method:

$$7y^2 - 5y - 2 = 0$$

- v. Draw histogram and hence the frequency polygon for the following frequency distribution:

Rainfall (in cm)	No. of Years
20 – 25	2
25 – 30	5
30 – 35	8
35 – 40	12
40 – 45	10
45 – 50	7

**4. Attempt any two of the following subquestions:**

[8]

- The 11<sup>th</sup> term and the 21<sup>st</sup> term of an A.P. are 16 and 29 respectively, then find the first term, common difference and the 34<sup>th</sup> term.
- If the point of intersection of  $ax + by = 7$  and  $bx + ay = 5$  is (3, 1), then find the value of a and b.
- In a certain race there are three boys A, B, C. The winning probability of A is twice than B and the winning probability of B is twice than C. If  $P(A) + P(B) + P(C) = 1$ , then find the probabilities of their winning.

**5. Attempt any two of the following subquestions :**

[10]

- Find the sum of all numbers from 50 to 250 which divisible by 6 and find  $t_{13}$ .
- Solve:  $9\left(x^2 + \frac{1}{x^2}\right) - 3\left(x - \frac{1}{x}\right) - 20 = 0$
- A three digit number is equal to 17 times the sum of its digits. If 198 is added to the number, the extreme digits get interchanged. The sum of first and third digit is 1 less than middle digit. Find the number.