

BOARD QUESTION PAPER : MARCH 2017

ALGEBRA

Time: 2 Hours

Max. Marks: 40

Note:

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

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

- i. State whether the following sequence is an Arithmetic Progression or not:
3, 6, 12, 24,.....
- ii. If one root of the quadratic equation is $3 - 2\sqrt{5}$, then write another root of the equation.
- iii. There are 15 tickets bearing the numbers from 1 to 15 in a bag and one ticket is drawn from this bag at random. Write the sample space (S) and n(S).
- iv. Find the class mark of the class 35—39.
- v. Write the next two terms of A.P. whose first term is 3 and the common difference is 4.
- vi. Find the values of a, b, c for the quadratic equation $2x^2 = x + 3$ by comparing with standard form $ax^2 + bx + c = 0$.

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

- i. Find the first two terms of the sequence for which S_n is given below:
 $S_n = n^2(n + 1)$.
- ii. Find the value of discriminant (Δ) for the quadratic equation:
 $x^2 + 7x + 6 = 0$.
- iii. Write the equation of X-axis. Hence, find the point of intersection of the graph of the equation $x + y = 5$ with the X-axis.
- iv. For a certain frequency distribution, the values of Assumed mean (A) = 1300, $\sum f_i d_i = 900$ and $\sum f_i = 100$. Find the value of mean (\bar{x}).
- v. Two coins are tossed simultaneously. Write the sample space (S), n(S), the following event A using set notation and n(A), where 'A is the event of getting at least one head.'
- vi. Find the value of k for which the given simultaneous equations have infinitely many solutions:
 $kx + 4y = 10$;
 $3x + 2y = 5$.

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

- i. How many three digit natural numbers are divisible by 5?
- ii. Solve the following quadratic equation by factorization method:
 $3x^2 - 29x + 40 = 0$.
- iii. Solve the following simultaneous equations by using Cramer's rule:
 $3x - y = 7$;
 $x + 4y = 11$.
- iv. Two dice are thrown. Find the probability of the event that the product of numbers on their upper faces is 12.
- v. The following is the frequency distribution of waiting time at ATM centre; draw histogram to represent the data:

Waiting time (in seconds)	Number of Customers
0 – 30	15
30 – 60	23
60 – 90	64
90 – 120	50
120 – 150	5

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

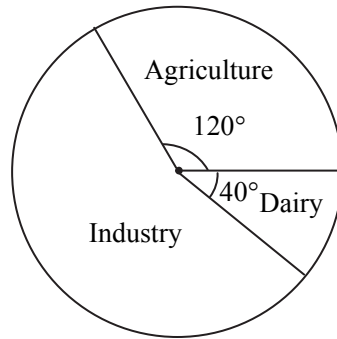
[8]

- i. Three horses A, B and C are in a race, A is twice as likely to win as B and B is twice as likely to win as C. What are their probabilities of winning?
- ii. The following is the distribution of the size of certain farms from a taluka (tehasil):

Size of Farms (in acres)	Number of Farms
5 – 15	7
15 – 25	12
25 – 35	17
35 – 45	25
45 – 55	31
55 – 65	5
65 – 75	3

Find median size of farms.

- iii. The following pie diagram represents the sectorwise loan amount in crores of rupees distributed by a bank. From the information answer the following questions:



- a. If the dairy sector receives ₹20 crores, then find the total loan disbursed.
- b. Find the loan amount for agriculture sector and also for industrial sector.
- c. How much additional amount did industrial sector receive than agriculture sector?

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

[10]

- i. If the cost of bananas is increased by ₹ 10 per dozen, one can get 3 dozen less for ₹ 600. Find the original cost of one dozen of bananas.
- ii. If the sum of first p terms of an A.P. is equal to the sum of first q terms, then show that the sum of its first (p + q) terms is zero where p ≠ q.
- iii. Solve the following simultaneous equations:

$$\frac{1}{3x} - \frac{1}{4y} + 1 = 0;$$

$$\frac{1}{5x} + \frac{1}{2y} = \frac{4}{15}.$$