

BOARD QUESTION PAPER : MARCH 2014

ALGEBRA

Time: 2 Hours

Max. Marks: 40

Note:

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

Q.1. Attempt any five of the following sub-questions:

[5]

- For an A.P. $t_3 = 8$ and $t_4 = 12$, find the common difference d .
- $(x + 5)(x - 2) = 0$, find the roots of this quadratic equation.
- The following data give the number of students using different modes of transport:

Modes of Transport	Bicycle	Bus	Walk	Train	Car
Number of Students	140	100	70	40	10

From this table, find the central angle (θ) for the Mode of Transport 'Bus'.

- 'A coin is tossed', write the sample space 'S'.
- If $\sum f_i x_i = 75$ and $\sum f_i = 15$, then find the mean \bar{x} .
- Write the following quadratic equation in a standard form: $3x^2 = 10x + 7$.

Q.2. Attempt any four of the following sub-questions:

[8]

- State whether the following sequence is an A.P. or not:
1, 4, 7, 10,
- Solve the following quadratic equation by factorization method:
 $4x^2 - 9 = 0$.
- If the point $(a, 3)$ lies on the graph of the equation $5x + 2y = -4$, then find a .
- If $7x + 5y = 11$ and $5x + 7y = 13$, find $x + y$.
- A die is thrown, then write the sample space (S) and number of sample points $n(S)$ and also write event A of getting numbers multiple of 3 on the upper face and write $n(A)$.
- For a certain frequency distribution, the value of mean is 15 and mode is 9. Find the value of median.

Q.3. Attempt any three of the following sub-questions:

[9]

- Solve the equation
 $4x^2 + 7x + 2 = 0$
by using formula method.
- Solve the following simultaneous equations by using Cramer's rule:
 $3x + 2y = -11$, $7x - 4y = 9$
- Two coins are tossed simultaneously. Write the sample space 'S' and the number of sample points $n(S)$. Write the following events using set notation and mention the total number of elements in each of them:
 - A is the event of getting at most one tail.
 - D is the event of getting no head.

- iv. Below is given the distribution of money (in ₹) collected by students for Flood Relief Fund:

Money (in ₹)	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
No. of Students	5	7	5	2	6

Find mean of money (in ₹) collected by a student by using ‘Assumed Mean Method’.

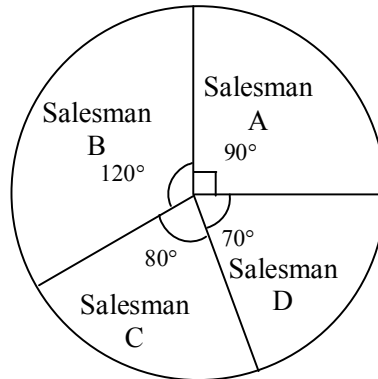
- v. Represent the following data by Histogram:

Price of Sugar per kg (in ₹)	18 – 20	20 – 22	22 – 24	24 – 26	26 – 28	28 – 30
Number of Weeks	4	8	22	12	8	6

Q.4. Attempt any two of the following sub-questions:

[8]

- A farmer borrows ₹ 1,000 and agrees to repay with a total interest of ₹ 140 in 12 instalments, each instalment being less than the preceding instalment by ₹ 10. What should be his first instalment?
- There are three boys and two girls. A committee of two is to be formed. Find the probability of events that the committee contains:
 - at least one girl
 - one boy and one girl
 - only boys.
- The sales of salesmen in a week are given in the pie diagram. Study the diagram and answer the following questions. If the total sale due to salesman A is ₹ 18,000 then:
 - Find the total sale.
 - Find the sale of each salesman.
 - Find the salesman with the highest sale.
 - Find the difference between the highest sale and the lowest sale.



Q.5. Attempt any two of the following sub-questions:

[10]

- If m times m^{th} term of an A.P. is equal to n times its n^{th} term, then show that $(m + n)^{\text{th}}$ term of the A.P. is zero.
- The product of four consecutive natural numbers which are multiples of five is 15,000. Find those natural numbers.
- Draw the graphs representing the equations $4x + 3y = 24$ and $3y = 4x + 24$ on the same graph paper. Write the co-ordinates of the point of intersection of these lines and find the area of the triangle formed by these lines on the X-axis.