

**Maharashtra Board
Class X Mathematics - Algebra
Board Paper - 2014**

Time: 2 hours

Total Marks: 40

Note:- (1) All questions are compulsory.
(2) Use of calculator is not allowed.

1. Attempt any five question from the following:

5

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

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

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

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

- 2. Attempt any four subquestions from the following:** **8**
- i. State whether the following sequence is an AP or not:
1, 3, 6, 10.....
 - ii. Solve the following quadratic equation by factorization method:
 $9x^2 - 25 = 0$
 - iii. If the point (3, 2) lies on the graph of the equation $5x + ay = 19$, then find a.
 - iv. If $12x + 13y = 29$ and $13x + 12y = 21$, find $x + y$.
 - v. A die is thrown. Write the sample space (S) and number of sample points $n(S)$ and also write event A of getting even number on the upper surface and write $n(A)$.
 - vi. For a certain frequency distribution, the value of mean is 20 and mode is 11. Find the value of median.

- 3. Attempt any three of the following subquestions:** **9**
- i. Solve the equation by using the formula method.
 $3y^2 + 7y + 4 = 0$
 - ii. Solve the following simultaneous equations by using Cramers's rule:
 $3x - y = 7$
 $x + 4y = 11$
 - iii. 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 number of elements in each of them:
 - (a) A is the event of getting at least one head.
 - (b) B is the event of getting exactly one head.
 - iv. The following table gives the frequency distribution of trees planted by different Housing Societies in a particular locality:

| No. of Trees | No. of Housing Societies |
|--------------|--------------------------|
| 10-15 | 2 |
| 15-20 | 7 |
| 20-25 | 9 |
| 25-30 | 8 |
| 30-35 | 6 |
| 35-40 | 4 |

Find the mean number of trees planted by Housing Societies by using 'Assumed Means Method'

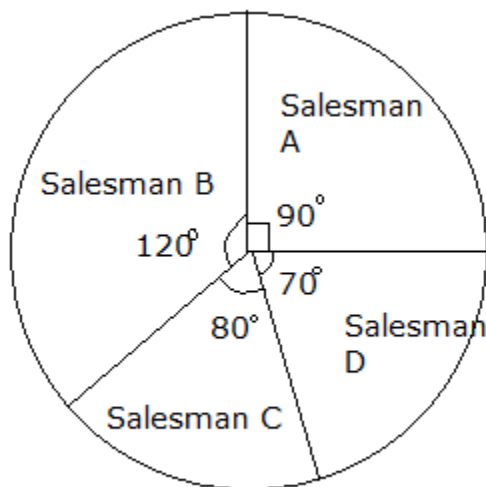
v. Represent the following data by Histogram:

| Price of Sugar per kg (in Rs.) | Number of Weeks |
|-----------------------------------|-----------------|
| 18-20 | 4 |
| 20-22 | 8 |
| 22-24 | 22 |
| 24-26 | 12 |
| 26-28 | 8 |
| 28-30 | 6 |

4. Attempt any two sub-questions from the following:

8

- i. A farmer borrows Rs.1,000 and agrees to repay with a total interest of Rs. 140 in 12 installments, each installment being less than the preceding installment by Rs. 10. What should be his first installment?
- ii. There are three boys and two girls. A committee of two is to be formed. Find the probability of events that the committee contains:
 - a) At least one girl.
 - b) One boy and one girl
 - c) Only boys.
- iii. 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 salesmen A is Rs. 18,000, then



- a) Find the total sale.
- b) Find the sale of each salesman.
- c) Find the salesman with the highest sale.
- d) Find the difference between the highest sale and the lowest sale.

5. Attempt any two of the following subquestions:

10

- i. If m times m th term of an A.P. is equal to n times its n th term, then show that $(m + n)$ th term of the A.P. is zero.
- ii. The product of four consecutive natural numbers, which are multiples of five, is Rs. 15,000. Find those natural numbers.
- iii. 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 triangle formed by these lines and the X-axis.