

I. Answer the following:

4 x 1 =4

1. For what value of k , will the pair of linear equations.

$$kx+2y=5$$

$$3x+y=1$$

have unique solution.

2. Find the point of intersection of the lines represented by

$$3x-2y=6$$

and the y axis.3. The internal and external radii of hemispherical bowl are r_1 and r_2 respectively. Find the curved surface area of the bowl.

4. Write the relationship connecting 3 measures of central tendency. Hence find the mode when mean is 146 and median is 130.

II. Answer the following questions:

4 x 2=8

5. Given the linear equation $3x - 4y - 7 = 0$ Write another linear equation in these two variables such that the geometrical representation of the pair so formed is

(i) Intersecting lines

(ii) Parallel lines

6. Solve the following pair of linear equation

$$x + 2y = 8 ; x - 3y = 13$$

7. A cylindrical tank has a capacity of 6160m^3 diameter of its base is 28m. Find the curved surface area of the cylinder.

8. Details of family income of 40 students of a class are given below. Calculate the arithmetic mean of the income.

| Family Income (in thousand ₹) | Number of students |
|----------------------------------|-----------------------|
| 10 - 25 | 10 |
| 25 - 40 | 4 |
| 40 - 55 | 18 |
| 55 - 70 | 6 |
| 70 - 85 | 2 |

III. Answer the following questions:

4 x 3 =12

9. Find the two numbers whose sum is 75 and difference is 15.

10. Solve for x and y

$$\frac{1}{x+1} + \frac{1}{y+1} = 10$$

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

11. 504 cones, each of diameter 3.5 cm and height 3cm are melted

and recast into the metallic sphere. Find the diameter of the sphere and hence find its surface area.

12. The median of the following distribution is 28.5. Find the values of x and y if the sum of frequencies is 58.

| Class | Frequency |
|---------|-----------|
| 0 - 10 | 2 |
| 10 - 20 | x |
| 20 - 30 | 20 |
| 30 - 40 | 15 |
| 40 - 50 | 7 |
| 50 - 60 | y |

IV. Answer the following questions:

4 x 4 =16

13. A boat goes 30km upstream and 44km downstream in 10 hours and in 13 hours, it can go 40km upstream and 55km downstream determine the speed of the stream and that of the boat in still water.

14. Draw the graph of $2x + y = 6$ and $2x - y + 2 = 0$. Shade the region bounded by these lines with the x - axis. Find the area of the shaded region.15. A bucket made up of metal sheet is in the form of the frustum of a cone of height 16cm with diameters of its lower and upper ends as 16cm and 40cm respectively. Find the volume of the bucket also find the cost of the bucket, if the cost of the metal sheet used is Rs.20 per 100cm^2 . (use $\pi = 3.14$)

16. Draw a cumulative frequency curve for the following frequency distribution.

| Class Interval | Frequency |
|----------------|-----------|
| 0 - 10 | 50 |
| 10 - 20 | 48 |
| 20 - 30 | 45 |
| 30 - 40 | 32 |
| 40 - 50 | 15 |
| 50 - 60 | 5 |