

**MATHEMATICAL FOUNDATION**

Time : 3 Hours

Max. Marks : 75

**SECTION – A (10 x 2 = 20)**

Answer ALL the questions.

1. Define set.
2. Write the types of functions.
3. If  $A = \begin{bmatrix} 1 & 3 & 5 \\ 6 & 7 & -9 \\ 4 & 3 & 2 \end{bmatrix}$ , find the transpose of A.
4. Write the formula for inverse of the matrix A.
5. Write the types of diagram.
6. Define statistics.
7. Write the formula for Harmonic Mean for individual series.
8. Find the mode for the following data 4, 5, 6, 4, 8, 9, 4, 3, 2.
9. Define Range.
10. If S. D. = 4, Mean = 40, find co-efficient of variation.

**SECTION – B (5 x 5 = 25)**

Answer any FIVE of the following questions.

11. If  $A = \{3,4,5\}$ ,  $B = \{2,6\}$ , find  $A \times B$ .
12. Prove that  $(A \cup B)' = A' \cap B'$  by Venn diagram.
13. Show that  $A = \begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$  is Orthogonal.
14. Define skew - symmetric matrix. Give an example.
15. Draw a Pie diagram for the data.

Ocean	Area
Pacific	70.8
Atlantic	41.2
Indian	28.5
Antartic	7.6
Artic	4.8
Total	152.9

16. Calculate Geometric mean for the following data.

 $X$  5 6 7 8 9 10 11 $F$  2 4 7 10 9 6 2

17. Find the standard deviation for the data.

62, 85, 73, 83, 74, 58, 66, 72, 54, 84.

18. Calculate Mean deviation and Mean to the following data.

153, 147, 151, 156 and 153.

**SECTION – C ( 3 x 10 = 30 )**

**Answer ALL the questions.**

19. (a) Define Equivalence relation. Give any one example.

(Or)

(b) Find the rank of the matrix

$$A = \begin{bmatrix} 1 & 2 & 5 \\ 2 & 3 & 4 \\ 3 & 5 & 7 \end{bmatrix}.$$

20. (a) Draw a histogram and find its mode.

Class interval	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	4	12	30	35	20	18

(Or)

(b) Find the Mean, Median and Mode for the following data.

Class interval	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50
Frequency	2	28	125	270	303	197	65	10

21. (a) Calculate the Quartile deviation from the following profits.

Sales (Rs. lakhs)	100-200	200-300	300-400	400-500	500-600
Companies	8	12	20	6	4

(Or)

(b) Calculate Co-efficient of variation for the following data.

55, 54, 52, 53, 56, 58, 52, 50, 51, 49.

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