

# Maths Paper - II

Time :  $2\frac{1}{2}$  Hours ]

**PARTS - A & B**

[ Maximum Marks : 50 ]

Instructions :

1. Answer the questions under Part - A on a separate answer book.
2. Write the answers to the questions under Part - B on the question paper itself and attach it to the answer book of Part - A.

Time : 2 Hours ]

**PART - A**

[ Marks : 35 ]

## SECTION - I (Marks : $5 \times 2 = 10$ )

Note : 1. Answer ANY FIVE questions, choosing atleast TWO from each of the following groups i.e., Group A and Group B.

2. Each question carries 2 marks.

### Group - 'A'

(Geometry, Analytical Geometry, Statistics)

1. A ladder 25 mts. long reaches a window of a building 20 mts. above the ground. Determine the distance of the foot of the ladder from the building.
2. A straight line makes intercepts 4 and -7 on the X and Y - axis. Find the equation of that line.
3. In what ratio is the line segment joining the points (4, 6) and (-7, -1) divided by the X - axis ?
4. Write the merits of the Arithmetic Mean.

### Group - 'B'

(Trigonometry, Matrices, Computing)

5. Find the value of  $\sin 55^\circ 40'$  from the given table.

Natural Sine Table

Minutes \ Degrees	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1	2	3	4	5
											(Mean differences)				
55°	0.8192						8251	8261			2	3	5	7	8

6. If  $A \times \begin{bmatrix} 1 & 1 \\ 0 & 2 \end{bmatrix} = \begin{bmatrix} 1 & 2 \end{bmatrix}$ , find the order of A and then find the determinant of A.
7. What are the essential components of a Computer ?
8. What should be kept in mind while writing an Algorithm ?

**SECTION – II (Marks :  $4 \times 1 = 4$ )**

**Note :** 1. Answer ANY FOUR of the following SIX questions.

2. Each question carries 1 mark.

9. Two circles of radii 5 cm and 12 cm touch externally. Find the distance between their centres.
10. Find the slope of a line making an angle  $\theta = 60^\circ$  with the positive direction of X - axis.
11. Convert  $270^\circ$  into circular measure.
12. Find the Arithmetic Mean of a first 'n' natural numbers.
13. Define 'non-singular' matrix.
14. Define Flow Chart.

**SECTION – III (Marks :  $4 \times 4 = 16$ )**

**Note :** 1. Answer ANY FOUR questions choosing atleast TWO from each of the following groups, A and B.

2. Each question carries 4 marks.

**Group – 'A'**

**(Geometry, Analytical Geometry, Statistics)**

15. State and prove converse of Basic Proportionality Theorem.
16. If  $(p, 2)$ ,  $(-3, 4)$ ,  $(7, -1)$  are collinear points, then find the value of p.
17. Find the equation of a line whose slope is  $\frac{4}{5}$  and which bisects the line joining the points  $P(1, 2)$  and  $Q(4, -3)$ .
18. Find the Median of the following data.

Class Interval	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100	100 – 120
Frequency	9	16	24	15	4	2

**Group – 'B'**

**(Trigonometry, Matrices, Computing)**

19. Show that :  $\sqrt{\frac{1+\cos\theta}{1-\cos\theta}} = \operatorname{cosec}\theta + \cot\theta$ .

20. If  $A = \begin{bmatrix} 2 & 4 \\ 3 & 6 \end{bmatrix}$ ,  $B = \begin{bmatrix} -2 & 5 \\ 6 & 1 \end{bmatrix}$ ,  $C = \begin{bmatrix} 1 & 2 \\ 3 & 0 \end{bmatrix}$  then show that  $A(B + C) = AB + AC$ .

21. Using Matrix Inversion method, solve the Simultaneous equations  $x = \frac{7-3y}{2}$ ,  $y = 13-6x$ .
22. Write an Algorithm and draw a Flow chart to pick the largest of the three given numbers.

**SECTION – IV (Marks :  $1 \times 5 = 5$ )**

**Note :** 1. Answer ANY ONE question from the following questions.

2. This question carries 5 marks.

23. Construct triangle ABC, in which  $BC = 4$  cm.,  $\angle A = 50^\circ$  and altitude through A = 3 cm.
24. From the ground and first floor of a building, the angle of elevation of the top of the spire of a church was found to be  $60^\circ$  and  $45^\circ$  respectively. The first floor is 5 mts. high. Find the height of the spire.

- Note :**
1. Each question carries equal marks, i.e.  $\frac{1}{2}$  mark.
  2. Answers are to be written in the question paper as directed.
  3. All questions are to be answered.
  4. Marks will **not** be awarded to over written, re-written or erased.

I. Write the 'CAPITAL LETTER' showing the correct answer in the bracket provided against each question.  $10 \times \frac{1}{2} = 5M$

1. If D is the midpoint of BC in  $\triangle ABC$ , then  $AB^2 + AC^2 = \dots\dots\dots$  [   
 A)  $AD^2 + BD^2$     B)  $2AD^2 + 2BD^2$     C)  $BD^2 + DC^2$     D)  $2AC^2 + 2CD^2$
2. If the distance between the centres of two circles of equal radii is 8 cm., then length of its direct common tangent is ..... [   
 A) 8 cm    B) 4 cm    C) 0 cm    D) 16 cm
3. The slope of a line parallel to the line  $3x - 2y + 1 = 0$  is ..... [   
 A)  $\frac{3}{2}$     B)  $\frac{2}{3}$     C)  $-\frac{3}{2}$     D)  $-\frac{2}{3}$
4. If  $a < 0$ , then  $(-a, a)$  lying in the quadrant ..... [   
 A) 1    B) 2    C) 3    D) 4
5. Formula for grouped data of 'Mode'..... [   
 A)  $L + \frac{\Delta_2}{\Delta_1 + \Delta_2} \times c$     B)  $L + \frac{\Delta_1}{(\Delta_1 + \Delta_2)c}$     C)  $L + \frac{(f - f_1)c}{2f - f_1 - f_2}$     D)  $L + \frac{f - f_1}{2f - f_1 + f_2} \times c$
6.  $\tan \theta = \dots\dots\dots$  [   
 A)  $\frac{1}{\sec \theta}$     B)  $\sqrt{\sec^2 \theta - 1}$     C)  $\sin \theta \cdot \cos \theta$     D)  $\sqrt{1 - \sec^2 \theta}$
7. If  $x = \tan \theta + \sec \theta$ ,  $y = \tan \theta - \sec \theta$ , then ..... [   
 A)  $xy = 1$     B)  $x^2 + y^2 = 1$     C)  $xy = -1$     D)  $x^2 - y^2 = 1$
8. Order of matrix A is  $2 \times 1$ , order of matrix B is  $2 \times 1$ , then the order of  $A + B$  is ..... [   
 A)  $2 \times 1$     B)  $4 \times 2$     C)  $2 \times 2$     D)  $1 \times 1$
9. While solving the equations  $3x + 4y = 8$ ,  $x - 6y = 10$  through Cramer's method, matrix  $B_1 =$  [   
 A)  $\begin{bmatrix} 8 & 4 \\ 10 & -6 \end{bmatrix}$     B)  $\begin{bmatrix} 3 & 8 \\ 1 & 10 \end{bmatrix}$     C)  $\begin{bmatrix} 3 & 4 \\ 1 & -6 \end{bmatrix}$     D)  $\begin{bmatrix} 4 & 8 \\ -6 & 10 \end{bmatrix}$
10. Which of the following is Computer language ? [   
 A) PASCAL    B) ENGLISH    C) TELUGU    D) FRENCH

II. Fill in the blanks with suitable answers.  $10 \times \frac{1}{2} = 5$

11. The ratio of the areas of two similar triangles is equal to the ratio of the ..... of any two corresponding sides.
12. In  $\triangle ABC$ , if the bisector of  $\angle A$  meets BC in D, then  $\frac{BD}{DC} = \dots\dots\dots$
13. (4, 7), (1, 4), (3, 2), (6, 5) are the vertices of Parallelogram, then the intersect point of its diagonal is .....

4. For a given data, Mean is 39, Median is 38, then the mode is .....
5. In a frequency distribution, the mid value of class is 35 and the lower boundary is 30, then its upper - boundary is .....
6. If  $\sin A = \cos A$ , then  $A =$  .....
7. The Arithmetic Mean of the values  $-3, -2, -1, 0, 1, 2, 3$  is .....
8. The data having two modes is called .....
9. Each Computer consists of three essential units, namely Input unit, Output unit and the ..... unit.
10. Large amount of information is stored in .....unit of a Computer.

11. For the following questions under Group A, choose the correct answers from the Master list (Group B) and write the letter of the correct answer in the brackets provided against each question.  $\left[10 \times \frac{1}{2} = 5M\right]$

Group - 'A'	Group - 'B'
21. Two circles touch internally, then the number of their common tangents is ...	[ ] A) 9.5
22. The slope of X - axis is	[ ] B) $\frac{1}{2}$
23. The slope of $x = 2y$ is	[ ] C) 2
24. Range of first 20 natural numbers is.	[ ] D) 10
25. Lower limit of 10 - 19 is	[ ] E) 1
	F) 0
	G) 19
	H) 14.5

Group - 'A'	Group - 'B'
26. $\sin (180^\circ + \theta) =$	[ ] D) 1
27. $\tan 135^\circ =$	[ ] J) Vacuum tubes
28. First Generation Computers used	[ ] K) $\sin \theta$
29. Second Generation Computers used	[ ] L) $-1$
30. $\begin{vmatrix} 9 & 7 \\ 5 & 4 \end{vmatrix} =$	[ ] M) Electronic circuits
	N) $-\sin \theta$
	O) 0
	P) Small transistors

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