

This Question Paper contains 4 Printed Pages.

16E(A)

MATHEMATICS, Paper - II

(English version)

Parts A and B

Time : 2½ Hours]

[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**.

Part - A

Time : 2 Hours

Marks : 35

SECTION - I

(Marks : 5×2=10)

NOTE :-

1. Answer **ANY FIVE** questions, choosing at least **TWO** from each of the following **Groups**, i.e., **A** and **B**.
2. Each question carries 2 marks.

GROUP - A

(Geometry, Analytical Geometry, Statistics)

1. If ABCD is a Rhombus, then prove that
 $AB^2 + BC^2 + CD^2 + AD^2 = AC^2 + BD^2$.
2. Show that the points A(1, 2), B(-3, 4) and C(7, -1) are collinear.
3. Find the area of triangle formed by the line $2x - 4y + 7 = 0$ with the co-ordinate axis.
4. Write the de-merits and merits of A.M.

16E(A)

[1]

P.T.O.

GROUP - B
(Trigonometry, Matrices, Computing)

5. If $8 \tan A = 15$, then find $\sin A - \cos A$.
6. If $A = \begin{bmatrix} 1 & 3 \\ 0 & 1 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 2 \\ 1 & 3 \end{bmatrix}$, then find $2A - 3B$.
7. What are the different boxes used in a Flow Chart?
8. What are the essential parts of a Computer?

SECTION - II

(Marks $4 \times 1 = 4$)

NOTE :-

1. Answer **ANY FOUR** of the following **SIX** questions.
2. Each question carries 1 mark.

9. State the converse of Pythagorean Theorem.
10. Find the slope of the line perpendicular to the line $5x - 2y + 4 = 0$.
11. Express $\tan \theta$ in terms of $\sec \theta$.
12. Find the Arithmetic mean of first " n " numbers.
13. Expand C.P.U.
14. If $A = \begin{bmatrix} -3 & 2 \\ 4 & 0 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 0 \\ 0 & 2 \end{bmatrix}$, then find AB .

SECTION - III

(Marks 4×4=16)

NOTE :-

1. Answer **ANY FOUR** of the following questions, choosing at least **TWO** from each groups i.e., Group A and B.
2. Each question carries 4 marks.

GROUP - A

(Geometry, Analytical Geometry, Statistics)

15. State and prove Alternate Segment Theorem.
16. Find the area of triangle enclosed between the co-ordinate axis and line passing through (8, -3) and (-4, 12).
17. Find the co-ordinates of the points of trisection of a segment joining A(-3, 2) and B(9, 5).
18. Find the median of marks scored by 50 students in a 50 marks test.

Marks	1-10	11-20	21-30	31-40	41-50
No. of students	3	12	16	14	5

GROUP - B

(Trigonometry, Matrices and Computing)

19. Prove that $\frac{\tan \theta + \sec \theta - 1}{\tan \theta - \sec \theta + 1} = \frac{1 + \sin \theta}{\cos \theta}$.
20. If $A = \begin{bmatrix} 1 & 4 \\ 0 & -1 \end{bmatrix}$, $B = \begin{bmatrix} 2 & m \\ 0 & -\frac{1}{2} \end{bmatrix}$ and $AB = BA$, then find value of m .

21. Solve the equation $3y = 4 - 2x$ and $x = \frac{y+1}{4}$ by using Cramer's method.

22. Draw the Flow Chart for solving $ax^2 + bx + c = 0$ by considering all possible cases.

SECTION - IV

NOTE :-

(Marks $1 \times 5 = 5$)

1. Answer **ANY ONE** of the following questions.

2. The question carries 5 marks.

23. Construct a triangle ABC, in which $AB = 4.4$ cm, $\angle C = 65^\circ$ and median through C is 2.7 cm.

24. Two boys are on opposite of sides of a tower, which is 100 metres tall. They measure the angle of elevation of top of the tower as 30° and 45° respectively. Find the distance through which the boys are separated.

Marks	1-10	11-20	21-30	31-40	41-50
No. of students					