PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BA DEGREE EXAMINATION DECEMBER 2018
(Third Semester)

Branch – ECONOMICS

MATHEMATICAL METHODS - I

Time : Three Hours   Maximum : 75 Marks

SECTION-A (20 Marks)
Answer ALL questions
ALL questions carry EQUAL marks   (10 x 2 = 20)

1   What do you mean by mathematical economics?

2   Define "Quadratic equation'.

3   What is geometric progression?

4   Define – Venn diagram.

5   How do you find the equation of a line given two points?

6   Write a short notes on returns to scale.

7   Define matrix.

8   What do you mean by rank of matrix?

9   State the meaning of minor of a matrix.

10   Define determinant of a matrix.

SECTION - B (25 Marks)
Answer ALL Questions
ALL Questions Carry EQUAL Marks (5 x 5 = 25)

11 a   Solve the following simultaneous equations.
$2x + 3y = 13$
$x + y = 5$

OR

    b   Describe the merits and demerits of mathematical economics.

12 a   If the ratio of the sum of the first 6 terms of a G.P. to the sum of the first 3 terms of the G.P. is 9, what is the common ratio of the G.P?

OR

    b   If $A = \{1, 3, 5\}$, $B = \{3, 5, 6\}$ and $C = \{1, 3, 7\}$, verify that $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$.

13 a   Obtain the equation of the straight line, if Y – intercept is 3 and slope is 4.

OR

    b   Explain the De Morgen's law with examples.

14 a   Discuss the properties of determinants.

OR

    b   If $A = \begin{pmatrix} 3 & 4 & 6 \\ 0 & 1 & 2 \\ 1 & 3 & 4 \end{pmatrix}$ $B = \begin{pmatrix} -1 & 3 & 1 \\ 2 & 2 & 0 \\ 0 & -4 & 5 \end{pmatrix}$ and $C = \begin{pmatrix} 1 & 0 & -2 \\ -1 & 1 & 3 \\ 1 & -2 & 1 \end{pmatrix}$

Find $2A - 3B + 5C$.

Cont ...

15 a   Solve the following system of linear equations by using the inverse matrix.

$3x - 6y = 45$

$9x - 5y = -8$

OR

   b   Find the inverse of matrix $A = \begin{pmatrix} 3 & 2 \\ 5 & -4 \end{pmatrix}$.

SECTION - C (30 Marks)
Answer any THREE Questions
ALL Questions Carry EQUAL Marks (3 x 10 = 30)

16   Discuss the importance of mathematical economics.

17 i)   Find the sum of the AP in the above question till first 10 terms.

  ii)   If A = <1, 2, 3, 4, 5, 6, 7, 8, 9>, B = <2, 4, 5, 6, 8, 9, 10> and C = <1, 3, 5, 8, 9, 10>. Find (a) A' ∪ B   b) B'∩ A   c) A' ∪ B' ∪ C' and d) (A ∪ B) – C'.

18 i)   Suppose the total cost function is $C = Q3 + 5Q2 - 10Q$, find average cost and Marginal cost.

  ii)   Explain procedure to calculate marginal product curves.

19   Find the inverse of the matrix

$$\begin{bmatrix} 4 & 0 & 2 \\ 2 & 10 & 2 \\ 3 & 9 & 1 \end{bmatrix}.$$

20   Solve the following linear equations by using Cramer's rule.

$x + y + z = -2$

$x - 2y + z = 3$

$2x - y - 3z = -1$

Z-Z-Z   END