

**PSG COLLEGE OF ARTS & SCIENCE**  
(AUTONOMOUS)  
**BA DEGREE EXAMINATION DECEMBER 2017**  
(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 Define mathematical economics.
- 2 Find the value of x if  $2x^2 - 18 = 0$ .
- 3 Define geometric progression.
- 4 What do you mean by super set?
- 5 What is polynomial function?
- 6 What is an indifference curve?
- 7 What is null matrix?
- 8 Write any two properties of a determinant.
- 9 What is meant by adjoint of a matrix?
- 10 What is minor?

**SECTION - B (25 Marks)**

Answer **ALL** Questions

**ALL** Questions Carry **EQUAL** Marks (5 x 5 = 25)

- 11 a Solve the following pair of simultaneous equations  
$$3x + 2y = 13$$
$$2x + 3y = 12$$

OR

b Solve:  $3x^2 + 7x + 2 = 0$ .
- 12 a The 3<sup>rd</sup> and 5<sup>th</sup> terms of the series in Geometric progression are 144 and 324. Find the 7<sup>th</sup> terms.  

OR

b If  $A = \{1, 2, 3, 4\}$ ,  $B = \{3, 4, 5, 6\}$  and  $C = \{1, 5, 6, 7, 8\}$ , verify that  $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$ .
- 13 a Obtain the equation and slope of the line joining the two points (1, 2) and (3, 4).  

OR

b Find the equation of the circle with centre (-2, 3) and radius 3.
- 14 a What are the types of matrices?  

OR

b Find the determinant value of  $A = \begin{bmatrix} 2 & 1 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$ .

Cont ....

15 a Compute minor for every element of the matrix  $A = \begin{bmatrix} 1 & 3 & 4 \\ 1 & 2 & 1 \\ 2 & 4 & 5 \end{bmatrix}$ .

OR

b Find the inverse of  $A = \begin{bmatrix} 4 & 0 & 2 \\ 2 & 10 & 2 \\ 3 & 9 & 1 \end{bmatrix}$ .

**SECTION - C (30 Marks)**

Answer any **THREE** Questions

**ALL** Questions Carry **EQUAL** Marks (3 x 10 = 30)

16 Analyse the merits and demerits of mathematical economics.

17 If  $A = \{1, 5\}$ ,  $B = \{6, 7, 8, 9\}$  and  $C = \{6, 7, 10\}$  prove that

(i)  $A \times (B \cup C) = (A \times B) \cup (A \times C)$  and

(ii)  $A \times (B \cap C) = (A \times B) \cap (A \times C)$ .

18 Find the centre and radius of the circle  $2x^2 + 2y^2 + 6x + 8y - 3 = 0$ .

19 Verify whether  $AB = BA$  for the matrices

$$A = \begin{bmatrix} 2 & 1 & 0 \\ 1 & -1 & 2 \\ 0 & 1 & 3 \end{bmatrix} \text{ and } B = \begin{bmatrix} 1 & 2 & -1 \\ -2 & 0 & 1 \\ 1 & 1 & 2 \end{bmatrix}.$$

20 Solve the equations by using Cramer's rule

$$2x - 3y + 4z = 5$$

$$x + 2y - 3z = 8$$

$$x - y - z = 1.$$

Z-Z-Z

END