PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BA EGREE EXAMINATION DECEMBER 2019
(First Semester)

Branch – **ECONOMICS**

MATHEMATICAL METHODS - I

Time: Three Hours Maximum: 75 Marks

SECTION-A (10 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (10 x 1 = 10)

1 $Y = 2x+3$ is a _____.
(i) Linear function (ii) Quadratic function
(iii) Cubic function (iv) Second degree function

2 Marginal cost curve can be derived with the help of ____.
(i) Constant function (ii) Polynomial function
(iii) Quadratic function (iv) Cubic function

3 A circle can have infinite _____.
(i) Line of symmetry (ii) Area
(iii) Number (iv) Circle of symmetry

4 A+B = B+A is _____.
(i) Associative law (ii) Commutative law
(iii) Existence of identify (iv) Existence of the inverse

5 The rank of 'Null matrix' is _____.
(i) Zero (ii) One
(iii) Two (iv) Three

6 The transpose of the transpose of a matrix is the _____.
(i) Cofactor (ii) Original matrix
(iii) Adjoint (iv) Minor

7 The _____ are called cofactor .
(i) Signed minor (ii) Signed Adjoint
(iii) Inverse (iv) Transpose

8 The determinate of _____is called minor.
(i) Square matrix (ii) Unit matrix
(iii) Row matrix (iv) Column matrix

9 The input – output take is called_____.
(i) Inverse of a matrix (ii) Transpose matrix
(iii) Transaction matrix (iv) Square matrix

10 The closed model contains_____.
(i) Open economy (ii) Closed economy
(iii) Mixed economy (iv) Socialist economy

SECTION - B (25 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** Marks (5 x 5 = 25)

11 a Explain the mathematical functions in economics.

OR

b $x^2+2x=15$ find the value of x.

12 a Describe the situation when the plane cuts the nappe.

OR

13 a If $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$, shows that $A^2-5A+7I=0$.

OR

b Enumerate the properties of transpose of a matrix.

14 a Compute cofactor for the matrix $A = \begin{bmatrix} 1 & 1 & -3 \\ 2 & 5 & 1 \\ 1 & 3 & 2 \end{bmatrix}$.

OR

b Find the inverse of the matrix $A = \begin{bmatrix} 2 & 2 \\ 3 & 5 \end{bmatrix}$

15 a Describe the usefulness of Input – Output analysis.

OR

b List out the limitation of Input-output analysis.

SECTION -C (40 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 x 8 = 40)

16 a Solve the following pair of simultaneous equations.

$6x-3(y-3)=9$

$2x-5(y-1)=-3$.

OR

b Evaluate the marginal and average revenue function for the total revenue function $R= 5Q - \frac{7Q3}{3}$.

17 a Explain total distance of a point parabola.

OR

b Find the centre radius of the circle $x^2+y^2-2x+4y=8$.

18 a If $A=\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ and $\begin{bmatrix} 0 & -1 \\ 6 & 7 \end{bmatrix}$ verify that $(AB)^T = B^TA^T$.

OR

18 b Find the rank of a matrix $A = \begin{bmatrix} 2 & 3 & 5 & 1 \\ 1 & 2 & 3 & 2 \\ 1 & 3 & 4 & 5 \end{bmatrix}$.

19 a Find the inverse of the matrix $A = \begin{bmatrix} 0 & -1 & 2 \\ 1 & -2 & -3 \\ 3 & 1 & 1 \end{bmatrix}$.

OR

b Solve the following equation using Cramer's rule.

$5x+3y=65$

$2y-z=11$

$3x+4z=57$

20 a In an economy of two industries A and B, the data given below in million of rupees

		Purchased by		Final demand	Total output
		A	B		
Sales by	A	12	6	6	24
	B	6	3	9	18

Determine the total out put , If the final demand charges to 18 for A and 36 for B.

OR