PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BA DEGREE EXAMINATION MAY 2022
(First Semester)
Branch – ECONOMICS

MATHEMATICAL METHODS - I

Time: Three Hours   Maximum: 50 Marks

SECTION-A (5 Marks)
Answer ALL questions
ALL questions carry EQUAL marks   (5 x 1 = 5)

1. A linear function is in the form.
   (i) $y = a + bx$ (ii) $y = a + bx + cx^2$ (iii) $y = an^x$ (iv) $y = a^x$

2. Which of the following is not a conic section?
   (i) Circle   (ii) Parabola   (iii) Ellipse   (iv) Apex

3. Which Matrix contains only one column is called -------- matrix.
   (i) Row   (ii) Column   (iii) Transpose   (iv) None

4. Which of the following is Ad joint of the Matrix
   i) $\begin{bmatrix} 1 & 2 \\ -1 & 4 \end{bmatrix}$ (ii) $\begin{bmatrix} 4 & -2 \\ 1 & 1 \end{bmatrix}$ (iii) $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ (iv) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

5. Indicate that the condition of Hawkins Simon of existence in output Vector as,
   (i) Negative   (ii) One Zero   (iii) Non Negative   d)None

SECTION-A (15 Marks)
Answer ALL Questions
ALL Questions carry EQUAL marks   (5 x 3=15)

6. a) How does partial equilibrium analysis deal with the interconnections that exist between the various markets in the economy?

   (OR)

   a) Is a cardinal measure of utility or satisfaction necessary in order to sketch a set of indifference curves?

7. a) Calculate the Distance between the two Points
   i)   (0,1) and (2,3)
   ii)   (1,2) and (2,3)
   iii)   (-1,0) and (3,4)

   (OR)

   b) Solve the equation of Straight line for the Points
   i)   (1,1) and (9,3)
   ii)   (0,0) and (10,5)

8. a) Classify the types of Matrix

   (OR)

   b) Show that A+B=B+A for A= $\begin{bmatrix} 3 & -1 \\ 4 & 0 \\ -1 & 5 \end{bmatrix}$ and B $\begin{bmatrix} 7 & 4 \\ 0 & 0 \\ 1 & -1 \end{bmatrix}$

Cont...

9. a) Find the Inverse of the Matrix $\begin{bmatrix} 0 & -4 \\ 3 & 2 \end{bmatrix}$.

(Or)

ii) Solve by Crammer's Rule, X-Y=-1 and X+Y=3.

10. a) Write the conditions of Hawkins Simon and give an example.

(Or)

b) Explain the dynamic Leontief model.

SECTION-C (30 Marks)
Answer ALL Questions
ALL Questions carry **EQUAL** marks   (5 x 6 =30)

11. a) Explain what is meant by constant returns to scale, increasing returns to scale, and decreasing returns to scale. Explain briefly how each of these might arise.

(OR)

b). What are some of the implicit costs incurred by an entrepreneur in running a firm? How are these implicit costs estimated? Why must they be included as part of costs of production?

12. a) Identify the following Curves and than their vertex focus and directrix of $5y^2=16x$ Given Equation is Parobola ($y^2=4ax$).

(OR)

b) Analyze the equation of the following circles
   i)   Centre (-1,2) and radius $\sqrt{3}$
   ii)   Centre (0,5) and radius 4
   iii)   Centre at origin and radius 2

13. a) justify $AB \neq BA$ when $A \neq B$ for A and B   A= $\begin{bmatrix} 2 & 1 & 0 \\ 1 & -1 & 2 \end{bmatrix}$ and B $\begin{bmatrix} 1 & 3 \\ 2 & 1 \\ 0 & 1 \end{bmatrix}$

(OR)

b) Point out the Rank of the following Matrix.

i) $\begin{bmatrix} 1 & 3 & 2 \\ 0 & -1 & 4 \\ 0 & 2 & -8 \end{bmatrix}$ (ii) $\begin{bmatrix} 3 & -1 & 4 \\ 1 & 3 & 2 \\ 0 & -1 & 4 \end{bmatrix}$ iii) $\begin{bmatrix} -1 & 4 & 1 \\ 3 & -12 & -3 \\ -2 & 8 & 2 \end{bmatrix}$

14 a) Identify the inverse of the Matrix $\begin{bmatrix} -1 & 0 & 1 \\ 2 & 1 & -2 \\ 0 & 0 & 3 \end{bmatrix}$

(OR)

b) Trace the value of X,Y and Z by Grammer's Rule for
$2x + y - z = 3, x + y + z = 1, x - 2y - 3z = 4$

15. a) Give the Limitations of open and closed models in economics.

(OR)

b) Give the leontief's closed and open model details.