(AUTONOMOUS)

**BA DEGREE EXAMINATION DECEMBER 2018**

(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 The distance of the point (3,-2) from the y-axis is _____.
(i) 2 (ii) -2
(iii) 3 (iv) $\sqrt{13}$

2 The radius of the circle $x^2+y^2=4$ is
(i) 4 (ii) -4
(iii) 2 (iv) -2

3 The solution of the equation 4x+3=2x+5 is
(i) x=1 (ii) x=2
(iii) x=4 (iv) x=½

4 Demand is a _____ function of price.
(i) Constant (ii) Negative
(iii) Positive (iv) None of these

5 The number of elements in a 2x3 matrix is
(i) 5 (ii) 6 (iii) 3 (iv) 2

6 A is 4x matrix and B is 1x4 matrix then BA is a _____ matrix
(i) 1x1 (ii) 4x4 (iii) 1x4 (iv) 4x1

7 Open model in matrix notarian is given by _____.
(i) X=AF+X (ii) F=AF+X
(iii) X=AX+F (iv) A=AX+F

8 Input-Output analysis is a technique which was invented by
(i) Hawkins (ii) W.Leontief
(iii) Both (i) and (ii) (iv) Neither (i) nor (ii)

9 The cofactor of an element is the minor of that element multiplied by
(i) -1 (ii) $(-1)^i$
(iii) $(-1)^j$ (iv) $(-1)^{i+j}$

10 The rank of a non-singular matrix of order nxn is _____.
(i) less than n (ii) more than n
(iii) 1 (iv) n

**SECTION - B (25 Marks)**

Answer **ALL** questions

**ALL** questions carry **EQUAL** Marks (5 x 5 = 25)

11 a Calculate the distance between the following pairs of points:
(i) (1,2) and (3,4) (ii) (6,-3) and (-4,-2)

OR

b Find the gradient and the intercept made by the following lines on the y-axis.

(i) $\sqrt{3}x - y + 3 = 0$ (ii) x-y-6=0

12 a Solve: $\frac{3x-7}{5} - \frac{3x+7}{4} = \frac{\sqrt{x}-9}{8} - \frac{3x+9}{6}$

OR

b Solve: $x^2-16x+48=0$

13 a If $A=\begin{bmatrix}3\\0\\5\\1\end{bmatrix}$, $B=\begin{bmatrix}4 & 2 & -1 & 0\end{bmatrix}$ Find AB and BA.

OR

b Find the value of the determinant

$$\begin{vmatrix}3 & 4 & 7\\2 & 1 & 3\\7 & 2 & 1\end{vmatrix}$$

14 a Find the rank of the matrix

$$A=\begin{bmatrix}1 & 3 & 4 & -2\\2 & 6 & 8 & -4\\3 & 0 & 3 & 3\end{bmatrix}$$

OR

b Solve the set of equations 3x+4y=5 and 3x-4y=2 by Cramer's rule.

15 a Explain the technological coefficient matrix.

OR

b Verify the Hawkins-Simon conditions for $[A]=\begin{bmatrix}0.8 & 0.2\\0.9 & 0.7\end{bmatrix}$

## SECTION -C (40 Marks)

Answer **ALL** questions

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

16 a The equation of the line is 3x-2y=6.
(i) Find whether the point (0,3) lies on the line.
(ii)Find the slope, x-intercept and the y-intercept of this line.
(iii) Find the equation of the line passing through (0,3) and perpendicular to the above line.

OR

b Find the equation of a circle which passes through the three points: (0,1), (5,1) and (2,-3).

17 a If $A=\begin{bmatrix}3 & 1\\2 & -1\end{bmatrix}$, find $A^2-5A+7I$.

OR

b State all the eight properties of determinants.

18 a Obtain the inverse of matrix:

$$A=\begin{bmatrix}1 & 2 & 3\\1 & 3 & 5\\1 & 5 & 12\end{bmatrix}$$

OR

b Solve the following system of equations:
x-2y+32=1; 3x-y+4z=3; 2x+y-2z=-1.

19 a State the limitations of Input-Output analysis.

OR

b Given $A=\begin{bmatrix}0.1 & 0.3 & 0.1\\0 & 0.2 & 0.2\\0 & 0 & 0.3\end{bmatrix}$ and final demands are $F_1$, $F_2$ and $F_3$. Find the output levels consistent with the mode. What will be the output levels if $F_1=20$, $F_2=0$ and $F_3=100$?

20 a Solve: (i) $(x-3)^2+(x-2)^2=1$

(ii) $\frac{x-2}{x-1}+\frac{x+2}{x+1}=0$.

OR

b One unit commodity A is produced by using 1 unit of land, 2 units of labour and 3 units of capital. For producing 1 unit of commodity B, 2units of land, 3 units of labour and 1 unit of capital are required. For producing 1 unit of