2022

ECONOMICS

[Honours]

(B.Sc. Second Semester End Examination-2022)

PAPER-CC4

Full Marks: 60 ***Time: 03 Hrs***

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

Illustrate the answers wherever necessary

Group A

1) Answer any Ten Questions: **10x2 = 20**

a. Define skew-symmetric matrix.

b. What is singleton matrix?

c. What is the rank of a matrix?

d. What do you mean by stationary value?

e. How do you obtain Marshallian demand function?

f. What do you mean by compensated demand curve?

g. If the Average Revenue (AR) function $AR=25-Q^2$, derive the Marginal Revenue (MR) function.

h. What is phase diagram?

i. Define inverse of a matrix.

j. Define rank of a matrix.

k. Define convex function.

l. What do you mean by homothetic production function?

m. Define Slack and Surplus variables in LPP.

n. Define basic feasible solution in LPP.

o. State Euler's theorm.

Group B

Answer any Four Questions: **4x5 = 20**

2. Find the inverse of a matrix A. $A=\begin{bmatrix} 4 & 3 \\ -7 & 2 \end{bmatrix}$ 5

3. If $A=\begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$, find the value of $A^2-6A+8I$. 5

4. Find out the stationary value z using Lagrange Multiplier method where $z=x-3y-xy$, subject to $x+y=6$ 5

5. Solve the differential equation $t^2\frac{dy}{dt}+ty=t^3$. 5

6. Solve the problem of LPP Graphically

Maximize $\Pi=2x_1+5x_2$

S.t $x_1 \le 4$

$x_1 \le 3$

$x_1+2x_2 \le 8$

$x_1, x_2 \ge 0$

7. Find dual of primal problem

Maximize $\Pi=9x_1+x_2$

S.t $2x_1+x_2 \le 8$

$4x_1+3x_2 \le 14$

$x_1, x_2 \ge 0$

8. Solve the equations by cramer's rule

$x+y+z=4$

$2x-y+3z=1$

$3x+2y-z=1$

Group C

Answer any Two Questions: **2x10 = 20**

9. Derive the Hawkins-Simon conditions in case of a two – industry input-output model. Also explain the economic implications of these conditions. 10

10. a) Given $A=\begin{bmatrix} 4 & 3 \\ 7 & 9 \end{bmatrix}$ and $B=\begin{bmatrix} 0 & -3 \\ 6 & 7 \end{bmatrix}$, show that $(AB)T=B^TA^T$. 5

b) Find the rank of the matrix $A=\begin{bmatrix} 3 & 4 & 5 \\ 5 & 7 & 9 \\ 6 & 8 & 10 \end{bmatrix}$ 5

11. The utily function of a consumer is $U=e^{xy}$. If the budget constrant is given by $M=Px.X+Py.Y$, show that the price elasticity of X or Y is unity. Comment on the nature of the demand curve of X and Y. 10

12. Let demand and supply are

$$Q_d = \alpha - \beta\rho + 6\frac{dp}{dt}$$

$$Q_S = -\gamma + SP \ [\alpha, \beta, \gamma, \delta > 0]$$

i) The rate of change of price over time is directly proposonal to excess demand, find the time path. 6

ii) Find the intertemporal equilibrium price. 4
