

(4)

- (e) Outline a typical linear programming problem.
- (f) Find the adjoint of A

$$A = \begin{pmatrix} 6 & 2 & 7 \\ 5 & 4 & 9 \\ 3 & 3 & 1 \end{pmatrix}$$

Group—D

4. Answer *any two* questions each within 300 words : $15 \times 2 = 30$

- (a) Discuss with examples the properties of a determinant.
- (b) Explain Cob-Web model.
- (c) Solve the linear programming problem graphically :

$$\text{Minimise } C = 0.6x_1 + x_2$$

subject to

$$10x_1 + 4x_2 \geq 20$$

$$5x_1 + 5x_2 \geq 20$$

$$2x_1 + 6x_2 \geq 12$$

$$x_1, x_2 \geq 0$$

Course Code

MEC – 03

Term End Examination – December, 2019

QUANTITATIVE METHODS FOR
ECONOMIC ANALYSIS

Master of Arts in Economics (MAEC)

Time : 3 hours

Full Marks : 100

The figures in the right-hand margin indicate marks

Answer **all** Groups as directed

Group—A

1. Answer *all* the questions, each within 1 word : $1 \times 10 = 10$

(a) $\lim_{x \rightarrow 2} \frac{x^2 - 4}{x - 2} = \text{_____}$.

(b) The derivative of $y = e^{-x}$ is _____.

(c) If $z = x^2 + y^2$, then $\frac{\partial^2 y}{\partial x^2}$ is _____.

(d) Criterion for point of inflection $\frac{d^2 y}{dx^2}$ is _____.

(2)

(e) $\int_{-3}^4 7 dx = \text{---}$.

(f) If $Y_{t+1} - Y_t = 4$, then find the order.

(g) If A is a $m \times n$ matrix and B is a $n \times k$ matrix, then product of AB is of the order.

(h) If

$$\begin{vmatrix} 1 & -3 \\ 3 & x \end{vmatrix} = 0$$

then $x = \text{---}$.

(i) In an input-output analysis the economy is divided into --- sectors.

(j) In simplex method we add --- variable in case of $= \text{---}$.

Group—B

2. Answer any four questions each within 100 words : $5 \times 4 = 20$

(a) If $y = \ln(4x^2 - 7x)$, then calculate $\frac{dy}{dx}$.

(b) If $4x^2 + 4xy + y^2 = 2$, then find $\frac{\partial^2 z}{\partial x^2}$, $\frac{\partial^2 z}{\partial y^2}$ and $\frac{\partial^2 z}{\partial x \partial y}$.

(3)

(c) Find the maxima of the function $y = 2x^3 - 6x$.

(d) $\int (5x^3 + 2x^2 + 3x) dx$

(e) Hawkins-Simon condition

(f) Symmetric matrix with example.

Group—C

3. Answer any four questions each should be within 200 words : $10 \times 4 = 40$

(a) What is the continuity of a function? Examine the continuity of the function at $x = 1$

$$f(x) = \frac{x+1}{x^2+1}$$

(b) For what value of q_1 and q_2 the given function $u = q_1^{1.5} q_2$ will have maximum value under the condition $3q_1 + 4q_2 = 100$.

(c) Given the marginal cost function $f'(x)$. Find the total cost function when the fixed cost is 50 units and $f'(x) = 2 + x + x^2$, x being the output produced.

(d) Explain transaction matrix.