GG(I) — Eco (3)

2019(New)

Time : 3 hours

Full Marks : 70

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

The figures in the margin indicate full marks.

Answer from **all** the Groups as directed.

Group – A
(Objective Type Questions)
(Compulsory)

1. Select the correct options of the following :

    $2 \times 10 = 20$

    (a) George B. Dantzig is associated with :

    (i) Linear programming

    (ii) Input output analysis

    (iii) Both (i) and (ii)

    (iv) None of these

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(b) A vector includes :

    (i)   Magnitude

    (ii) Direction

    (iii) Both (i) and (ii)

    (iv) None of these

(c) Transpose of a Column Matrix is :

    (i)   Zero Matrix

    (ii) Diagonal Matrix

    (iii) Column Matrix

    (iv) Row Matrix

(d) The possibility of point of inflexion arises only when :

    (i)   The function does not represent maximum value

    (ii) The function does not represent minimum value

    (iii) The function neither represent-maximum value nor minimum value

    (iv) None of the above

(e) If $y = x^4$ then $\dfrac{dy}{dx}$ is :

   (i) $4x^3$

   (ii) $4x^4$

   (iii) Both (i) and (ii)

   (iv) None of these

(f) $y = 2x + 3$ is :

   (i) Implicit function

   (ii) Explicit function

   (iii) Even function

   (iv) None of these

(g) When profit will be maximum $\dfrac{d\pi}{dx}$ will be :

   (i) 0 (Zero)

   (ii) 1 (One)

   (iii) ∞ (Infinity)

   (iv) None of these

(h) A firm is said to be in equilibrium when its :

   (i) MC = MR

(ii) MC = AC

(iii) MC = AR

(iv) None of these

(i) Input output technique was invented by :

(i) Adam Smith

(ii) Marshall

(iii) W. Leontief

(iv) None of these

(j) Integration of $y = 7x^2$ is :

(i) $\dfrac{7x^3}{3} + C$

(ii) $\dfrac{7x^2}{2} + C$

(iii) 0 (Zero)

(iv) None of these

Group – B

(Short-answer Type Questions)

Answer any four questions of the following :

$5 \times 4 = 20$

2. What is Vector ? Explain its properties.

3. Explain the relationship between TR, AR and MR.

4. If demand function is $X = 20 - P^2$ and $P = 2$ then find out elasticity of demand.

5. If $A = \begin{bmatrix} 2 & 3 \\ 2 & 4 \end{bmatrix}_{2 \times 2}$ and $B = \begin{bmatrix} 4 & 5 \\ 11 & 9 \end{bmatrix}_{2 \times 2}$

Find :

(a) $A + B$

(b) $A - B$

6. Write short notes on Feasible Region of linear programming.

OR

Write short notes on Hawkins-Simon conditions of Input output Analysis.

Group – C

(Long-answer Type Questions)

Answer any three questions of the following :

$$10 \times 3 = 30$$

7. A firm has the following total cost function :

$$TC = Q^3 - 3Q^2 + 15Q + 27$$

Find out TFC, TVC, AC, AVC and AFC.

8. Find out differentiation $\left(\dfrac{dy}{dx}\right)$ of the following :

(a) $y = x^2 + 50$

(b) $y = \dfrac{1}{x^2}$

(c) $y = \sqrt{3x}$

(d) $e^x \cdot 9x$

(e) $y = \dfrac{1}{x^2 + 1}$

9. If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 2 \\ 2 & -1 \end{bmatrix}$

Find :

(a) AB

(b) BA

(c) $2A - 3B$

(d) $3B - 2A$

10. The demand function of two commodities x and y are $P_1 = 8 - 2x$ and $P_2 = 14 - y^2$ and joint cost function is $C = 10 + 4x + 2y$. Determine the quantities that maximises the profit of monopolist and also find the maximum profit.

11. Consider the following Linear Programming problems :

Maximise $f = 2x + 5y$

Subject to : $x + 4y \le 24$

$3x + y \le 21$

$x + y \le 9$

$x \ge 0, y \ge 0.$

OR

Find out the gross output for each industry for the final demand 18 and 44 units respectively :

Industry	A	B	Final Demand
A	16	20	4
B	08	40	32

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