

COPYRIGHT RESERVED GG(II) — Eco (CC – 3)

2024
(Session : 2023-25)

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)

1. Select the correct answer of the following :

$2 \times 10 = 20$

(a) The Derivative of a constant is :

- (i) Zero
- (ii) One
- (iii) Infinity
- (iv) None of these

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(Turn over)

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(b) An Inverse function of $y = f(x)$ is :

(i) $y = f^{-1}(x)$

~~(ii)~~ $x = f^{-1}(y)$

(iii) $x = \frac{1}{f^{-1}(y)}$

(iv) None of these

(c) If all the diagonal elements are equal to 1. It is defined as :

(i) Trace

(ii) Idempotent Matrix

~~(iii)~~ Identity Matrix

(iv) All of these

(d) If $y = (3\sqrt{x})^4$, then dy/dx will be :

(i) $3/4 x^{1/3}$

(ii) $\frac{1}{3} x^{4/3}$

(iii) $3/4 x^3$

~~(iv)~~ $4/3 x^{1/3}$

(e) Who developed the technique of Linear Programming ?

(i) W. W. Leontief

~~(ii)~~ G. B. Dantzing

(iii) Adam Smith

(iv) All of them

(f) The first order condition for minimum value of a function is :

(i) $dy/dx > 0$

(ii) $dy/dx < 0$

~~(iii)~~ $dy/dx = 0$

(iv) $dy/dx \geq 0$

(g) The slope of the demand curve is :

(i) Positive

~~(ii)~~ Negative

(iii) Constant

(iv) Infinity

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(h) The value of the determinant $|A| = \begin{bmatrix} 5 & 4 \\ -9 & 3 \end{bmatrix}$

will be :

$$15 - (-36) \\ 15 + 36 \\ 51$$

~~(i)~~ 51

(ii) 21

(iii) - 51

(iv) - 21

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

~~(i)~~ $7x^3/3 + C$

(ii) $7x^2/2 + C$

(iii) $7x/4 + C$

(iv) None of these

(j) The possibility of a point of inflexion arises only when :

(i) The function does not represent maximum value

(ii) The function does not represent minimum value

~~(iii)~~ Neither (i) nor (ii)

(iv) None of these

Group – B

(Short-answer Type questions)

Answer any **four** questions from the following :

$$5 \times 4 = 20$$

2. What is function ? Explain different types of function.

3. If $[A] = \begin{bmatrix} 5 & 2 \\ 9 & -1 \end{bmatrix}$ and $B = \begin{bmatrix} -3 & 8 \\ 2 & 0 \end{bmatrix}$ find :

(a) $A + B$

(b) $A \times B$

(c) $A - B$

4. Explain the different characteristics of Cobb-Douglas Production function, mathematically.

5. Write a short note on Zero sum or Constant sum Game.

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6. Explain the concept of :

- (a) Consumer's surplus
- (b) Producer's surplus

Group – C

(Long-answer Type questions)

Answer any **three** questions from the following :

$$10 \times 3 = 30$$

7. Marginal Cost is given by $MC = 25 + 30Q - 3Q^2$,
fixed cost is 55. Find the :

- (a) TC
- (b) AC
- (c) TVC

8. (a) What is Linear Programming ? Write its assumptions.

(b) Solve the following Linear Programming Problem by Graphical Method :

$$\text{Maximize : } Z = 30x_1 + 50x_2$$

Subject to

$$x_1 + x_2 \geq 9$$

$$x_1 + 2x_2 \geq 12$$

and

$$x_1 \geq 0, x_2 \geq 0$$

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Contd.

9. Describe Mathematically the different characteristics of C. E. S. Production function.

10. Use Cramer's Rule to solve for the x_1 and x_2 in each of the following :

(a) $2x_1 + 6x_2 = 22$

$-x_1 + 5x_2 = 53$

(b) $7x_1 + 2x_2 = 60$

$x_1 + 8x_2 = 78$

11. Evaluate :

$$A = \begin{bmatrix} 2 & 45 & 55 \\ 1 & 29 & 32 \\ 3 & 68 & 87 \end{bmatrix}$$

54

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11.2
3x6
318