



Date: 22-11-2022

Dept. No.

Max. : 100 Marks

Time: 09:00 AM - 12:00 NOON

PART – A

Answer any FIVE questions:

(5 x 4 = 20 Marks)

1. Graph the linear function $y = 30 - 5x$
2. What is a quadratic function?
3. Find the determinant of the matrix $A = \begin{bmatrix} 13 & 6 \\ 0 & -3 \end{bmatrix}$
4. Find the partial derivatives
 - a. $z = x^2 - 9xy + 9y^2$.
 - b. $z = 7y^3 + x^2y + 2y^27x^3$
5. List out the Conditions for a function to be a Maxima or Minima?
6. Determine the following Integral $\int (8x^3 - x + 5) dx$
7. List out the different types of integrals with example.

PART – B

Answer any FOUR questions:

(4 x 10 = 40 Marks)

8. Explain in brief all the Functions that have applications in Economics.
9. Bring out the different types of matrices.
- 10.(a) Explain the Relationship between AR, MR and Elasticity of demand using differentiation.
(b) Verify Euler's theorem for the function $u = 3x^2 + 3y^2 + 3xy^2$
11. For the total revenue function $TR = 500q - 2q^2$, Find the value of MR when $q = 20$.
12. If $P = 80 - 4q$ is the linear demand function, write out the total revenue and the marginal revenue functions.
13. Write down the rules of differentiation.
14. List out the basic rules of Integration and give examples for each rule.

PART – C

Answer any TWO questions:

(2 x 20 = 40 Marks)

15. Solve the system of equations using Cramer's method

$$\begin{array}{rcl} 2x - y + 3z & = & 9 \\ x + y + z & = & 6 \\ x - y + z & = & 2 \end{array}$$

16. Discuss all the properties of determinants.

17. Given the total cost function $C = 5q + \frac{q^2}{50}$ and the demand function $q = 400 - 20p$.

- (a) Find the total revenue function
- (b) Maximise the total revenue function
- (c) Maximise profit function

18. (A) Give the Integration expression of Consumer and Producer Surplus.

(B). The demand for a product is given by $p=d(q)=-0.8q+150$ and the supply for the same product is given by $p=s(q)=5.2q$. For both functions, q is the quantity and p is the price. Find the equilibrium point; the consumer's surplus and producer's surplus at the equilibrium price.
