



Date: 08-11-2017

Dept. No.

Max. : 100 Marks

Time: 01:00-04:00

**PART-A**

Answer any FIVE questions in about 75 words each

Marks 5x4=20

1. Find the slope of the line joining the two points ( 5,3 ) and ( 2,1 ).

2. Define Transpose of Matrix.

3. Verify  $2(A+B) = 2A+2B$

$$\text{IF } A = \begin{pmatrix} 2 & 3 & -1 \\ 1 & 2 & 0 \\ 3 & 4 & 1 \end{pmatrix} \quad B = \begin{pmatrix} 1 & 0 & 6 \\ 2 & 4 & 0 \\ 3 & 1 & -1 \end{pmatrix}$$

4. If  $I = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$  and  $E = \begin{pmatrix} 0 & 1 \\ 0 & 0 \end{pmatrix}$  Prove that  $(2I+3E)^3 = 8I+36E$

5. Determine  $dy/dx$  for  $y = x-1/x+1$

6. Given the revenue function  $R=300+1200Q-Q^2$ , find out Marginal and Average Revenue functions.

7. Define Consumer 's surplus and producer's surplus .

**PART-B**

Answer any FOUR questions in about 250 words each

Marks 4 x 10= 40

8. Solve the equation  $12x^3 - 6x^2 = 0$

9. Find the rank of matrix.

$$\begin{pmatrix} 1 & 2 & -1 & 3 \\ 2 & 4 & -4 & 7 \\ -1 & -2 & -1 & -2 \end{pmatrix}$$

10. State the various rules of Differentiation.
11. Derive the relationship between AC and MC.
12. The demand function  $P = 30 - 2x$ . The supply function  $2P = 5 + x$ , find consumer's surplus.
13. Find R, AR and MR for Demand function  $q = 100 - 2p$ , where q is quantity demanded and P is price.
14. Find the first and second order partial derivatives for  $Z = 3x^2 - 2x^2y + 2xy^3 + y^3 + 8$

**Part C**

**Answer any TWO questions in about 900 Words each**

**Marks 2 x20=40**

15. State the various properties of determinants with suitable examples.
16. Solve the Equations by using Cramer's Rule.

$$2x - 3y + 4z = 5$$

$$x + 2y - 3z = 8$$

$$x - y - z = 1$$

- 17 (a) The marginal cost of production is found to be  $MC = 1000 - 20x + x^2$ . Where x is the number of units produced, the fixed cost of production is the 9000. Find the cost function.

- (b) If the marginal revenue function for the output x is given by  $MR = 6 / (x + 2)^2 + 5$ .

Find the total revenue function and demand equation

18. Examine the maxima and minima of the function  $Z = 3x^2 + y^2 - 3xy$

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