**ST. JOSEPH’S COLLEGE (AUTONOMOUS), BENGALURU -27**

Registration Number:

Date & Session14-12-2022 (9am)

**B.A. – V SEMESTER**

**SEMESTER EXAMINATION: OCTOBER 2022**

**(Examination conducted in December 2022)**

**ECADE 5318 - MATHEMATICAL ECONOMICS**

**Time: 2 ½ Hours Max Marks: 70**

**This paper contains 2 printed pages and 3 parts**

(Kindly note: Calculators/Scientific calculators are permitted)

**PART – A**

1. **Answer any 10 questions out of the given 12 questions [10 x 3 = 30]**
2. Compute Marginal Utilities of X and Y for the utility function **U = 5XY – Y2**
3. State the results of MR, given the following elasticities, µ. **(a) If µ= 1, then MR =? (b) µ > 1 then MR =? and (c) µ < 1 then MR =?**
4. If MR is Rs. 15 and the elasticity of Demand is 4, find AR [price]
5. If AR (Price) is Rs 18 and MR is Rs.12, find µ(elasticity)
6. Find the elasticity of demand, if the Demand function **q = 30 -5p - p2**
7. Compute marginal productivity of Labour(L) for the marginal productivity theory of Labour of at K = 1 and L = 2 for the production function **X = 3KL2+ 4k2L +2L+2k**

1. Test the homogeneity of Cobb – Douglas production function.
2. Verify Euler’s Theorem, **x.** $\frac{df}{dx}$ **+ y.** $\frac{df}{dy}$ **= 3f** for the function **f (x, y) = x3 + 3y3 – x2y.**
3. Compute Total cost function for the marginal cost function **C = 4 + 7X – 5 X2, If** the fixed cost is 40.
4. If the marginal Revenue function **R = 9 – 4X2,** find the total and average cost function.
5. Calculate the compound interest on Rs. 15,000 for 2 years at 6 % per annum
6. Find the values of P1 and P2 by solving the following equations **2P1 + 3P2 =13 and P1 + 7P2 =23** using Cramer’s Rule.

**PART – B**

1. **Answer any 2 questions out of the given 3 questions [2 x 5 = 10]**
2. Find out MU of Y at X = 2 and Y = 3 for the TU function **U = 2X3Y +3XY2+3X+3Y**
3. Compute marginal product of X and Y for the total product function $ U= \frac{x3+y3}{x2-y2}$
4. Find the elasticity of Demand, when the demand function $ q= \frac{20}{p+1}$ **and p=3**

**PART – C**

1. **Answer any 2 questions out of the given 3 questions [2 x 15 = 30]**
2. For the total production function **U = (3X + 7Y) (X – 5),** Find the Marginal product of X and Y at X = 2 and Y = 1.
3. State the conditions of equilibrium and derive the level of output, price, TR, TC, and π for **R = 12 x – 4 x2 and AC = 8 - x.**
4. Given the demand function for the 2 separate markets and the TC of the Monopoly firm,

**P1 = 16 - 2Q1**

**P 2 = 29 – Q2 and**

**TC 0r C = 8Q1 + 2Q2 +9**

Find the price, output or quantity and the maximum profit both under the price discrimination and when price discrimination is banned. [ where P=P]

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