

Al-Saudia Virtual Academy
Pakistan Online Tuition – Online Tutor Pakistan

“ECONOMICS” (PAPER-V-C) 1999

“MATHEMATICAL ECONOMICS”

Time allowed: Three Hours

Max.Marks:100

INSTRUCTIONS: 1) Attempt any five questions.

2) All questions carry equal marks.

1-a) Eta Corporation's cost function is given by $c(x) = 2.3x^2 + 4000x$, and the demand function for its product by $P = 10000 - 0.1x$. Find Eta's maximum profit, and the number of units the company must make and sell and the price per unit it must charge in order to attain its maximum profit.

b) The demand and supply functions for a commodity are given by:

$$d = -8500p + 183500$$

$$s = -6250p - 15625$$

What are the significance of the slopes and intercepts of these functions? Find the market equilibrium price for the commodity.

2-a) A pin Company needs to increase its revenue. The Marketing department has recommended a 5 percent decrease in the price the company charges for its pins, arguing that this would increase the quantity demanded so much that revenue would actually increase. The accounting department has recommended a 5 percent increase in the price, arguing that would increase revenue because the resulting decrease in quantity demanded would be more than offset by the higher price. Suppose the demand function for pins is given by $q = -1250p + 25000$, where p is the price per dozen pins and q is quantity in dozens of pins. Whose recommendation should be taken if the current price per dozen of pins is (i) Rs.6? (ii) Rs. 10? (iii) Rs.12?

b) A firm's fixed cost is Rs.92000, its variable cost per unit is Rs.46, and it sells each unit for Rs.62. Find its cost, revenue and profit functions and its break-even quantity.

3-a) Find the relative minimum, relative maximum, and inflection point (if any) for the following functions:

$$F(x) = 2x^3 - 12x^2 + 18x + 1$$

b) Find the derivation dy/dx , if y is defined implicitly as a function of x by the equation $xy + y^2 = 1$

4-a) If $f(x, y, z) = x^2y^3 + xyz + z^2$, find all second partial derivatives of f .

b) Given production function:

$$f(x, y) = 0.1x^{3/4}y^{3/4}$$

Where x represent worker – hours per week and y rupees of capital per week. Find marginal productivity of labor capital when $x = 1296$ any $y = 2500$

5-a) Define Quadratic Equation, State and explain quadratic formula, solve the first equation by factorization and second by quadratic formula.

$$(i) \quad X^2 + 5x = 36 \quad (ii) \quad 3x^2 - x = 7$$

b) For a two commodity market the equilibrium conditions are given by the equations.

$$15 p_1 - p_2 = 345$$

$$-2 p_1 + 35p_2 = 1000$$

Where p_1 and p_2 are the prices of tea and coffee in rupees per 500 grams respectively. Find the equilibrium price for each market using Crammer's Rule.

6-a) for the following system of equations:

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

$$X + 4y + 2z = 9$$

$$4x + 2y + 3z = 8$$

Solve for x, y and z using matrix inversion method.

b) State and explain the properties of determinant using a second order determinant.

7-a) simplifies the following in terms of logarithms of prime numbers and then fined the value. Given

$$\log 2 = 0.3010, \log 3 = .4010$$

$$\text{Log } 75/16 - 2 \log 5/9 + \log 32/243 \log 5 = .6910$$

b) State and explain Laplace Expansion Method for Solution of a determinate

.8. Write Short note on the following:

a) Properties of Limits, b) Rules of Differentiation.