LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.A. DEGREE EXAMINATION – **ECONOMICS**

FIFTH SEMESTER – APRIL 2010

EC 5404 - MATHEMATICS FOR ECONOMISTS

Date & Time: 29/04/2010 / 9:00 - 12:00 Dept. No. | | Max. : 100 Marks

PART – A

Answer any FIVE questions in about 75 words each. (5 x 4 = 20 marks)

1. Define differential coefficient.
2. Find $\frac{dz}{dx}, \frac{dz}{dy}, \frac{d^2z}{dx}, \frac{d^2z}{dy}$ *and* $\frac{d^2z}{dxdy}$

   $Z = \log_e(x^2 + 2xy - y^2)$
3. Find the rate of change of Y w.r.t. X, when $Y = (2X-3)^{7/3}$
4. If demand function is Q_d =100-5p, find the price at which elasticity of demand is unitary.
5. What are the properties of a continuous function?
6. Define definite integral.
7. Find the value of $\lim_{x \to 0} \sqrt{25 - x^2}$

PART – B

Answer any FOUR questions in about 250 words each. (4 x 10 = 40 marks)

8. Show that $MR = AR\left(1 - \frac{1}{|e_d|}\right)$
9. Explain the theorems on limit.
10. Derive elasticity of substitution form $Q = A\left[\alpha L^{-\beta} + (1-\alpha)K^{-\beta}\right]^{-\frac{1}{\beta}}$

    Where Q = output; L=labour; K = Capital.
11. If $q = e^{-2p}$ calculate the price elasticity 'η' when p = 2.
12. State "Eluer's Theorem".
13. Using Lagrangeian multiplier method, maximize $U = 10q_1.q_2$ subject to $100 - 5q_1 + 10q_2 = 0$.
14. Show that slope of AR is half of the slope of MR where AR is a liner function of output.

PART – C

Answer any TWO questions in about 900 words each. (2 x 20 = 40 marks)

15. Discuss the properties of Cobb-douglas production function.
16. Solve (x + y)dx + (x - y)dy = 0.
17. (i) Evaluate $\int x\sqrt{a^2 - x^2}.dx$

    (ii) Find the producers surplus for the supply function p = 10-2q when the equilibrium price for the product is Rs. 20.
18. If the demand function for x and y are p = 36 -3x and q = 40 – 5y and the joint-cost function is $TC = x^2 + 2xy + 3y^2$ determine the quantities and prices that maximize profit for the monopolist and find the maximum profit.

****