LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

FIFTH SEMESTER – **APRIL 2012**

# EC 5404 - MATHEMATICS FOR ECONOMISTS

Date : 30-04-2012 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART – A**

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

1. Define continuity of a function.
2. If marginal revenue is R’ = 15 – 9x – 3x2, find the total revenue and demand functions.
3. Find elasticity of demand (y) with respect to price (x), y = 100 – 5x
4. Evaluate ∫ 2x (x2 + 1) dx
5. State the conditions for saddle point.
6. The Total revenue (R) and Total cost (C) functions of a firm are given by: R = 30Q – Q2 and C = 20 + 4Q, where Q is the output. Find the equilibrium output of the firm.
7. Write the two cross elasticities of demand for commodities x1 & x2 and prices p1 & p2.

**PART – B**

**Answer any FOUR questions in about 300 words each (4 x 10 = 40)**

1. Briefly explain the various properties of limits.
2. Examine the following function for maximum and minimum values:

Z = 4 x3 + y2 – 4x + 8y

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1. Show that AC and MC curves intersect at the lowest point of the Ac function.
2. Determine maxima and minima, sketch the curve representing each function for y = x4 – 4x3 + 12
3. Explain the various types of discontinuities with examples.
4. State and prove the Euler’s theorem.
5. Find the total differential of
   1. Z = 2x2 + 5x2y + xy2 + y2
   2. Z = (2x2 + y) (x + 2y2)

**PART – C**

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

1. Derive the relation between Average and Marginal Revenue curves.
2. Explain the various rules for differentiation. Enumerate the correction procedures for 0/0 case, ∞ case and rational polynomial functions.
3. Find the maximum of the function f(x, y) = 5x2 + 6y2 – xy under the condition that x+2y =24.
4. If Demand: y = 50 – 6x and Cost: yc = x2 + 9x, determine maximum profit for the monopolist and the maximum revenue for the government if a tax of ‘t’ per unit is imposed.

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