LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.A. DEGREE EXAMINATION – ECONOMICS

FIFTH SEMESTER – NOVEMBER 2018

EC 5404 – MATHEMATICS FOR ECONOMICS

Date: 01-11-2018   Dept. No.   Max. : 100 Marks
Time: 09:00-12:00

PART–A

Answer any FIVE questions in about 75 words each   (5x4=20)

1. Evaluate $\lim\limits_{x \to 1} \dfrac{x^2 - 2x + 3}{x + 4}$

2. Find $\dfrac{d^2 y}{dx^2}$ for y = 7x^3 + 4x^2 – 3x + 2

3. Write a short note on 'Point of Inflexion'.

4. Evaluate $\int 3x^3 + 7x^2 - 2x + 1$

5. Find elasticity of demand (y) with respect to price (x), y = 100 – 5x

6. If the total cost function is C = 4x, adjust the cost function for a subsidy of 's' per unit of output given by the government.

7. The Total Cost is given as y = 200 + 1000x - 24x^2 + 4x^3 + x^4. Find the Average Cost and Marginal Cost.

PART–B

Answer any FOUR questions in about 250 words each   (4x10=40)

8. Enumerate the various properties of limits.

9. Find the maximum and minimum values (if any) of the function y = 2x^3 – 3x^2 – 36x + 10

10. Find the first and second order partial and cross-partial derivatives for Z = 2x^2 + xy + 4y^2 +xz + z^2 + 2.

11. Find the maximum of the function f(x, y) = 5x^2 + 6y^2 – xy under the condition that x+2y =24.

12. The marginal cost function is $\dfrac{dc}{dx}$ = 10 + 24x – 3x^2. If the total cost of producing one unit is Rs.25, find the Total cost function and Average cost function.

13. The demand function faced by a firm is p = 500 – 0.2x and its cost function is C = 25x + 10000, where p is the price, x is output and C is the total cost. Find the profit maximizing output and price.

14. State and prove Euler's theorem with an illustration.

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PART–C

Answer any TWO questions in about 900 words each (2x20=40)

15. Derive the relationship between AC and MC using derivatives.

16. If Demand: $y = 50 – 6x$ and Cost: $y_c = x^2 + 9x$, determine maximum profit for the monopolist and the maximum revenue for the government if a tax of 't'per unit is imposed.

17. Elucidate the significance of differentiation in economic application.

18. Find the consumer surplus and the producer surplus for an item whose supply and demand functions are given by: $S(x) = 4x + 2$ and $D(x) = 20 − x^2$ for x thousands of units and prices in rupees.

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