

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 86
(For Candidates admitted during the academic year 2008 – 2009 & thereafter)

SUBJECT CODE: EC/MC/MM14

B.A. DEGREE EXAMINATION NOVEMBER 2010
BRANCH IV – ECONOMICS
FIRST SEMESTER

COURSE : MAJOR – CORE
PAPER : MATHEMATICAL METHODS
TIME : 3 HOURS

MAX.MARKS: 100

SECTION – A

ANSWER ALL QUESTIONS. EACH ANSWER NOT TO EXCEED 50 WORDS.

(10 X 3 = 30)

1. Write down the distance formula and section formula.
2. Define locus of a point.
3. Find the equation of a straight line passing through (0,1) and making intercept on the x axis twice that on the y axis.
4. Write down the angle between two straight lines.
5. If the demand function is $P = 2 - X$ obtain the Marginal revenue function.
6. Define continuity of function at a point.
7. Find the slope of the function $Y = e^X$ at $X = 2$.
8. State the order conditions for maxima, minima and point of inflexion.
9. Test for homogeneity of the function $Z = X^2 Y - X^3 + Y^3$
10. State Euler's theorem.

SECTION – B

ANSWER ANY FIVE QUESTIONS. EACH ANSWER NOT TO EXCEED 300 WORDS.

(5 X 6 = 30)

11. The total cost Y for X units of a certain product consists of fixed cost and the variable cost. It is known that the total cost is Rs. 6000 for 600 units and Rs. 9000 for 1000 units. Find the linear relationship between X and Y. Find the slope of the line. What does it indicate?
12. Locate focus, vertex and equation of the directrix and latus rectum of the parabola $y = 5x - 2x^2$. Also sketch the function.
13. If $y - xe^x + \log(x - y) = 0$ find $\frac{dy}{dx}$.
14. Given the demand function $P = \sqrt{12 - X}$ obtain elasticity of demand at $x = 3$.
15. For what values of X is the $y = x^3$ convex/concave.
16. If $Z = \frac{x+y}{x-y}$ show that cross partial derivatives are equal.
17. Bring out the relationship between Average Cost and Marginal Cost.

SECTION - C

ANSWER ANY TWO QUESTIONS.EACH ANSWER NOT TO EXCEED 1200 WORDS. (2 X 20 =40)

18. a. Write down the significance of rectangular hyperbolic functions in economics
b. Show that revenue function is a parabola if the demand function is linear.
19. Given the demand function $P = 2 - X^2$ establish the relationship between AR, MR, and Elasticity of demand.
20. Find maxima, minima and point of inflexion if any of the function $y = x^3 - 3x - 1$
21. A given product can be manufactured at a total cost function given by :
 $C = \text{Rs. } \{(x^2/100) + 100x + 40\}$, where x is the number of units produced. The price at which each unit can be sold is given by : $p = \text{Rs } \{200 - (\frac{x}{400})\}$. Determine the production level x at which profit is maximum. What is the price per unit and the total profit at this level of production?
