

**STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 86**  
**(For Candidates admitted during the academic year 2009 – 2010 & thereafter)**

**SUBJECT CODE: EC/PE/MM13**

**M.A. DEGREE EXAMINATION NOVEMBER 2010**  
**BRANCH III – ECONOMICS**  
**FIRST SEMESTER**

**COURSE : ELECTIVE**  
**PAPER : MATHEMATICAL METHODS - I**  
**TIME : 3 HOURS**

**MAX.MARKS : 100**

**SECTION – A**

**ANSWER ANY FIVE QUESTIONS. EACH ANSWER NOT TO EXCEED 300 WORDS:** **(5 X 8 = 40)**

1. Examine continuity of the function  $Y = 1/(x-2)$
2. Show that  $[d(\log x)/dx] = 1/x$
3. Given the demand function  $P = 2 - x$ , establish the relationship between AR, MR and elasticity of demand.
4. Minimise  $Z = 18x^2 + 9y^2$  subject to  $x + y = 54$
5. Examine the nature of the function  $y = x^3$
6. Obtain first order total differential of the function  $Z = \{(x^3+y^3)/(x-y)\}$
7. Given the Marginal cost function  $MC = X^2 - 3X + 1$ , fixed cost as Rs 10000 Find
  - (i) Total cost
  - (ii) AC when  $X = 1$  unit
  - (iii) AVC when  $X = 2$  units
  - (iv) FC when  $X = 10$  units
  - (v) AFC when  $x = 5$  units

**SECTION – B**

**ANSWER ANY THREE QUESTIONS: EACH ANSWER NOT TO EXCEED 1200 WORDS:** **(3 X 20 = 60)**

8. a. Given the total cost function  $C = (1/3)x^3 - 3x + 9$ , bring out the relationship between AC, and MC  
b. Given the demand function  $P = 3 - 2X$  find Output X when total revenue is maximum
9. Discuss the properties of CES production function
10. Show that Indifference curves are convex to the origin.
11. Derive Slutsky equation.
12. Given the Demand and supply functions find consumer's surplus and producer's Surplus  
Demand function:  $P = 18 - 2x - x^2$   
Supply function:  $P = 2X + 3$

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