

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 86
(For Candidates admitted during the academic year 2011 – 2012)

SUBJECT CODE: 11EC/MC/MM14

B.A. DEGREE EXAMINATION NOVEMBER 2011
BRANCH IV – ECONOMICS
FIRST SEMESTER

COURSE : MAJOR – CORE
PAPER : MATHEMATICAL METHODS FOR ECONOMICS-I
TIME : 3 HOURS MAX.MARKS: 100

SECTION – A

I. ANSWER ALL QUESTIONS. (10 X 2 = 20)

1. Show that $(2, -1, 3)$, $(1, -1, 0)$ and $(3, -1, 6)$ are collinear.
2. Find the unit normal vectors to the plane $2x - y - 2z = 5$
3. Find the slope of tangent to the curve $Y = 3x^2 + 3 \sin X$ at $x = 0$.
4. Find the equation of the hyperbola if centre $(0, 0)$ length of the semi-transverse axis is 5: $e = 7/5$ and the conjugate axis is along the x-axis.
5. Find $\lim_{x \rightarrow 2} (x^2 - 4) / x - 2$
6. Find the derivative of $4x^2 + 3x + 2$ from first principle.
7. Define Differentiation?
8. Find y_1 and y_2 if $y = 5x^3 + 2x^2 + 1$
9. Define partial derivative.
10. The total cost of function of a commodity is given by $C(x) = 0.5x^2 + 2x + 20$ Find the marginal cost.

SECTION – B

II. ANSWER ANY FIVE QUESTIONS (5 X 8 = 40)

11. Find the vector and Cartesian equation of the plane through the point $(1, 3, 2)$ and parallel to the lines

$$(x+1)/2 = (y+2)/-1 = (z+3)/3 \text{ and } (x-2)/1 = (y+1)/2 = (z+2)/2$$

12. Find the equation of the plane passing through the point (2,1,-1) and the line of intersection of the planes

$$r(i+3j-k)=0 \text{ and } r(i+2k)=0.$$

13. Find the axis of the parabola if $y^2-2y+8x-23=0$?

14. Find the eccentricity of the conic if $9x^2+5y^2-54x-40y+116=0$

15. Differentiate (a) $(x^2+1)(x+2)$ (b) $x^3e^x \log x$ (c) $e^x(1+x)$

16. The cost for a monopolist firm producing X radios per week is given to be $4x^2-80x+500$. To have minimum cost how many units should be produced per week.

17. Find the second order partial derivatives of $u = \log(x^2+y^2)$

SECTION - C

III. ANSWER ANY TWO QUESTIONS.

(2 X 20 =40)

18. a) The line $5x-2y+4k=0$ is tangent to $4x^2-y^2=36$ then find k ?
b) Find the radius of the director circle of conic $9x^2+16y^2=144$

19. Find the relationship between Average and Marginal Cost

- i) When AC falls $MC < AC$
- ii) When AC is minimum $MC = AC$
- iii) When AC rises $MC > AC$

20. Find the elasticity of demand for the demand function $x=27/p^3$

21. a) Find the maxima and minima of $Z = f(x,y) = 3x^2 + y^3 - 3xy$
b) Using Euler's theorem prove the following $u = x^3 + y^3 + z^3 + 3xyz$
