STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086
(For candidates admitted during the academic year 2015 – 16)

SUBJECT CODE : 15MT/AC/BM35

B. Com. DEGREE EXAMINATION, NOVEMBER 2016
CORPORATE SECRETARYSHIP
THIRD SEMESTER

COURSE : ALLIED – CORE
PAPER : BUSINESS MATHEMATICS
TIME : 3 HOURS **MAX. MARKS : 100**

SECTION – A **(10 X 2 = 20)**
ANSWER ALL THE QUESTIONS

1. Define a scalar matrix with an example.
2. If A= (1 2 3 4) and $B = \begin{pmatrix} 1 \\ 2 \\ 3 \\ 4 \end{pmatrix}$ find AB and BA.
3. Find the value of k if 3+2i is a root of the equation $x^2 - 6x + k = 0$
4. If α, β, γ are the roots of $x^3 + px^2 + qx + r = 0$ find the value of $\alpha^2 + \beta^2 + \gamma^2$
5. Show that the root of $x^3 - 6x - 13 = 0$ lies between 3 and 4.
6. Solve the linear system $x_1 - 4x_2 = -2$; $3x_1 + x_2 = 7$ by Gauss-Jordan method.
7. If $y = \frac{x-1}{x+1}$ find $\frac{dy}{dx}$.
8. If $y = (3x^2 + 4x - 5)^3$ find $\frac{dy}{dx}$.
9. Evaluate $\frac{4x^3}{x^4+1}\ dx$.
10. Evaluate $xe^x dx$.

SECTION – B **(5 X 8 = 40)**
ANSWER ANY FIVE QUESTIONS

11. Verify Cayley Hamilton theorem for $\begin{pmatrix} 1 & 2 & 3 \\ 0 & -1 & 2 \\ 1 & 0 & 2 \end{pmatrix}$ and hence find its inverse.
12. Solve $x^4 - 5x^3 + 4x^2 + 8x - 8 = 0$, given that $1 + \sqrt{5}$ is a root.
13. Solve $2x^3 - 3x^2 - 11x + 6 = 0$ given its roots are in Arithmetic Progression.
14. Evaluate $\sqrt{12}$ to four decimal places by Newton - Raphson method.
15. Solve the following system of equations by Gaussian elimination method.

$x_1 - x_2 + x_3 = 1$; $-3x_1 + 2x_2 - 3x_3 = -6$; $2x_1 - 5x_2 + 4x_3 = 5$

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16. The total cost function for the production of x units of an item is given by $10 - 4x^3 + 3x^4$. Find (i) The average cost (ii) The marginal cost (iii) The marginal average cost.

17. Evaluate $\frac{x}{(x-1)(2x+1)}\,dx$.

SECTION – C **(2 X 20 = 40)**

ANSWER ANY TWO QUESTIONS

18. (a) Find the Eigen values and Eigen vectors of $\begin{pmatrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{pmatrix}$.

(b) Solve $2x^5 + 7x^4 + 9x^3 + 9x^2 + 7x + 2 = 0$ (10+10 marks)

19. Solve the system of equations using Gauss-Seidel method:

$8x - y + z - 18 = 0$; $2x + 5y - 2z - 3 = 0$; $x + y - 3z + 6 = 0$

20. (a) Find the maximum and minimum values of $2x^3 - 3x^2 - 36x + 10$

(b) The marginal cost of production of a firm is given by $C'(x) = 5 + 0.13x$.

The marginal revenue is given by $R'(x) = 18$. The fixed cost is Rs.120.

Find the profit function. (10+10 marks)

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