STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086
(For candidates admitted during the academic year 2008 – 09 & thereafter)

SUBJECT CODE : MT/AC/MT34

B. Com. DEGREE EXAMINATION, NOVEMBER 2011
COMMERCE
THIRD SEMESTER

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

SECTION – A (10 X 2 = 20)

ANSWER ALL THE QUESTIONS

1. Show that the matrix $\begin{pmatrix} 0 & 1+i \\ -1+i & 0 \end{pmatrix}$ is skew Hermitian.
2. Prove that the inverse of an orthogonal matrix is orthogonal.
3. Show that the matrix $\begin{pmatrix} \frac{1}{\sqrt{2}} & \frac{i}{\sqrt{2}} \\ \frac{-i}{\sqrt{2}} & \frac{-1}{\sqrt{2}} \end{pmatrix}$ is unitary.
4. If α, β, γ are the roots of the equation $x^3 + px^2 + qx + r = 0$, Find the value of $\sum \alpha^2$.
5. Form the quadratic equation one of whose roots is $1+2i$
6. Define interpolation.
7. Write Lagrange's formula for interpolation.
8. Find $\frac{dy}{dx}$ if $x^2 + y^2 = 4ax$
9. Find the second derivative of $\frac{1}{(ax+b)^2}$
10. Evaluate $\int \frac{dx}{x^2 + x + 6}$

SECTION – B (5 X 8 = 40)

ANSWER ANY FIVE QUESTIONS

11. Find the eigen values and eigen vectors of the matrix $\begin{pmatrix} 4 & 1 \\ 3 & 2 \end{pmatrix}$
12. Solve the equation $x^3 - 12x^2 + 39x - 28 = 0$ whose roots are in A.P.

..2

13. Solve the equation $x^4 - 10x^3 + 26x^2 - 10x + 1 = 0$.

14. A function $f(x)$ is given by the following table. Find $f(0.2)$ using a suitable formula.

x	0	1	2	3	4	5	6
$f(x)$	176	185	194	203	212	220	229

15. Using Lagrange's formula, Find $y(10)$ from the following table.

x	5	6	9	11
Y	12	13	14	16

16. Find $\frac{dy}{dx}$ if $xy + xe^{-y} + ye^{x} = x^2$

17. Evaluate $\int x\sin^2 x\,dx$

SECTION – C (2 X 20 = 40)

ANSWER ANY TWO QUESTIONS

18. a) Using Cayley Hamilton theorem, Find the inverse of the matrix $\begin{pmatrix} 1 & 3 & 7 \\ 4 & 2 & 3 \\ 1 & 2 & 1 \end{pmatrix}$

b) Find the eigen values and eigen vectors of the matrix $\begin{pmatrix} -2 & 2 & -3 \\ 2 & 1 & -6 \\ -1 & -2 & 0 \end{pmatrix}$

(10+10)

19. a) Solve the equation $x^3 + x^2 - 16x + 20 = 0$, given that the difference between two of its roots is 7.

b) Find the values of y at $x = 28$ from the following data.

x	20	23	26	29
y	.342	.3907	.4384	.4848

(10+10)

20. a) Find the differential coefficient of $\frac{(1-x)\sqrt{x^2+2}}{(x+3)\sqrt{x-1}}$

b) Evaluate $\int \frac{1}{3x^2+13x-10}\,dx$.

c) Evaluate $\int \frac{4x-3}{x^2+3x+8}\,dx$.

(6+5+9)

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