STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086
(For candidates admitted during the academic year 2011 – 12 & thereafter)

SUBJECT CODE : 11MT/AC/BM34

B. Com. DEGREE EXAMINATION, NOVEMBER 2014
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 transpose of a matrix.
2. If A = $\begin{pmatrix} 3 & 5 \\ 2 & -1 \\ 6 & 7 \end{pmatrix}$ B = $\begin{pmatrix} 5 & -7 \\ -2 & 4 \end{pmatrix}$. Find AB.
3. Define linear function.
4. Find the slope of the curve $y = 5x + 2$ at the point (-1, 4).
5. The ratio of number of boys and girls in a school is 4:3. If there are 480 boys in the school, find the number of girls in the school.
6. If 120 men can do a job in 100 days, in how many days will 150 men do it.
7. Find the points of discontinuity of the function $\frac{x^2 + 6x - 8}{x^2 - 5x + 6}$.
8. Differentiate $\frac{3 + 2x - x^2}{x}$ with respect to x.
9. Evaluate $\int 4x^3 dx$
10. Find the total revenue function, if the marginal revenue for a commodity is $MR = 9 - 6x^2 + 2x$

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

11. Find x if $\begin{vmatrix} 1 & x & -4 \\ 5 & 3 & 0 \\ -2 & -4 & 8 \end{vmatrix} = 0$.
12. Show $\begin{vmatrix} 1 & b+c & b^2+c^2 \\ 1 & c+a & c^2+a^2 \\ 1 & a+b & a^2+b^2 \end{vmatrix} = (a-b)(b-c)(c-a)$.
13. Evaluate $\lim_{x \to 0} \frac{\sqrt{2+3x} - \sqrt{2-5x}}{4x}$
14. Find the equation of the straight line which has perpendicular distance 5 units from the origin and the inclination of perpendicular with the positive direction of x axis is 120°.

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15. If the interest is compounded annually, find the compound interest on Rs. 2,000 for 3 years at 10% per annum.

16. The relationship between profit P and advertising cost x is given by $P = \frac{4000x}{5000 + x} - x$. Find x which maximizes P.

17. The demand of a commodity is $p = 28 - x^2$. Find the consumers' supplies when demand $x_0 = 5$.

SECTION – C **(2 X 20 = 40)**

ANSWER ANY TWO QUESTIONS

18. (a) Solve the equations $x + 2y + z = 7;\ 2x - y + 2z = 4;\ x + y - 2z = -1$ by Cramer's rule.

(b) Define the following functions: demand, supply, cost, revenue and profit.

(10+10)

19. (a) After working for 8 days, Anil finds that only $\frac{1}{3}$ of the work has been done. He employs Rakesh who is 60% efficient as Anil. How many more days will Anil take to complete the job?

(b) Find the global maximum and minimum values of the function $f(x) = 3x^5 - 25x^3 + 60x + 1$ in the interval $[-2,1]$.

(10+10)

20. (a) A manufacturing company purchases 9000 parts of a machine for its annual requirements. Each part costs Rs.20. The ordering cost per order is Rs.15 and carrying charges are 15% of the average inventory per year.

Find (i) economic order quantity (ii) time between each order (iii) minimum average cost.

(b) Evaluate (i) $\int \frac{dx}{\sqrt{4x^2 - 9}}$ (ii) $\int x \sin 2x\, dx$ (iii) $\int_0^1 x(1-x)^5\, dx$.

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