

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

SUBJECT CODE : 11MT/AC/MC24

B. Sc. DEGREE EXAMINATION, APRIL 2014
BRANCH IV - CHEMISTRY
SECOND SEMESTER

COURSE : ALLIED CORE

PAPER : MATHEMATICS FOR CHEMISTRY - II

TIME : 3 HOURS

MAX. MARKS : 100

SECTION – A

ANSWER ALL THE QUESTIONS:

(10X2=20)

1. Solve $(D^2 - 4D + 3)y = 0$
2. Find the Particular integral of $(D^2 - 3D + 2)y = e^{2x}$
3. Find $L(\sin t)$
4. Find $L(t^2 e^{-3t})$
5. Find $L^{-1}\left(\frac{1}{(s+2)^2}\right)$
6. Find $L^{-1}\left[\frac{1}{s^2 + 25}\right]$
7. If $f(x)=k$ find a_0 in $-\pi < x < \pi$
8. What is the range of correlation
9. If variance of $X = 9, b_{xy} = 0.45$ & $r = 0.6$ find the value of variance of Y
10. Write the normal equation to the st.line.

SECTION – B

ANSWER ANY FIVE QUESTIONS:

(5X8=40)

11. Solve $(D^2 - 4D + 4)y = e^{2x} + x^2$
12. Solve $(D^2 + 4)y = \cos 2x$
13. Find i) $L(e^{at})$
ii) $L(\cosh at)$
14. Find $L^{-1}\left(\frac{s}{s^2 + 4s + 13}\right)$
15. Find the Fourier series to the function $f(x) = \frac{1}{2}(\pi - x)$ in the interval $(0, 2\pi)$.

16. Calculate the rank correlation between the ranks given below

$$R_1: 10 \ 8 \ 1 \ 2 \ 6 \ 9 \ 3 \ 5 \ 4 \ 7$$

$$R_2: 6 \ 10 \ 5 \ 4 \ 3 \ 1 \ 2 \ 9 \ 8 \ 7$$

17. Fit a st. line for the following data

$$\text{Year} : 1997 \ 1998 \ 1999 \ 2000 \ 2001$$

$$\text{Sales} : 70 \ 74 \ 80 \ 86 \ 90$$

SECTION – C

ANSWER ANY TWO QUESTIONS:

(2X20=40)

18. a) Solve $(D^2 - 7D + 6)y = e^{2x} \cdot \sin 3x$

b) i) $L(e^t \cdot t \cdot \sin 2t)$ ii) $L\left(\frac{\sin t}{t}\right)$

19. a) Solve the differential equation $y'' - 2y' + y = e^t$; if $y(0) = 2$ and $y'(0) = 1$

b) If $f(x) = \begin{cases} -x; & -\pi < x < 0 \\ x & 0 < x < \pi \end{cases}$, expand $f(x)$ as a Fourier Series in $-\pi < x < \pi$.

20. a) Calculate correlation coefficient for the following data:

$$X : 50 \ 60 \ 58 \ 47 \ 49 \ 33 \ 65 \ 43 \ 46 \ 68$$

$$Y : 48 \ 65 \ 50 \ 48 \ 55 \ 58 \ 63 \ 48 \ 50 \ 70$$

b) Solve $(D^2 + 2D + 1)y = x^2 + 2x$

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