Roll.No. | 25UCSGT1001

SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.
B.Sc. Computer Science - END SEMESTER EXAMINATIONS - NOVEMBER 2025
SEMESTER - I
25UCSGT1001 -Mathematics for Computer Science - I

Total Duration : 2 Hrs.30 Mins. Total Marks : 60

Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. Find the coefficient of x^n in $\frac{1+2x+3x^2}{e^x}$.
2. Sum the series to infinity $\frac{1}{1.2} - \frac{1}{2.3} + \frac{1}{3.4} - \frac{1}{4.5} + ...$
3. Find the Eigenvalues of the matrix A $= \begin{bmatrix} 2 & 0 & 1 \\ 0 & 2 & 0 \\ 1 & 0 & 2 \end{bmatrix}$.
4. Express $\tan 5\theta$ in terms of $\tan\theta$.
5. Expand $\cos^6\theta$ in a series of cosines of multiples of θ.
6. Find the Laplace Transform of $\frac{e^{-3t}\sin 2t}{t}$.
7. Evaluate L$\left[t^2 e^{3t}\sin ht\right]$
8. Show that $L^{-1}\left[s\ log\frac{s-1}{s+1}\right] = \frac{2(\sinh t - t\cosh t)}{t^2}$.

Section C

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. Find the sum to infinity of the series $\frac{7}{72} + \frac{7.28}{72.96} + \frac{7.28.49}{72.96.120} + ...$
10. Obtain the Eigenvalues and Eigenvectors of
A$= \begin{bmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & -1 & 3 \end{bmatrix}$.
11. Expand $\sin^4\theta\cos^2\theta$ in a series of cosines of multiples of θ.

Contd...

12. (i) Evaluate $L\left[e^{3t}\sin^2 t\right]$.

    (ii) Find the Laplace transform of $\dfrac{1-cost}{t^2}$.

13. Evaluate $L^{-1}\left[\dfrac{s+2}{(s^2+4s+5)^2}\right]$.

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