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.
BCA END SEMESTER EXAMINATIONS NOVEMBER -2023
SEMESTER - I
20UCAAT1001 - Allied Mathematics - I

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

Section B

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

1. Show that $(p \wedge q) \wedge \sim (p \vee q)$ is a Tautogy or contradiction.
2. Expand $\sin^7\theta$ in a series of sines of multiples of θ.
3. Express $\frac{sin6\theta}{sin\theta}$ in terms of cos θ.
4. If cos(x + iy) = cosθ + i sinθ then prove that cos 2x + cosh2y = 2.
5. Find i) L(e^{-at} sin 6t) ii) L[t $\sin 2^t$].
6. Prove that L (t^n) = $\frac{n!}{s^{n+1}}$ if n is a positive integer.
7. Find $L^{-1}\left(\frac{1}{s(s+1)(s+2)}\right)$
8. Find $L^{-1}\left(\frac{s-3}{s^2+4s+13)}\right)$

Section C

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

9. Construct the Truth Table for the following and write the Truth Set for the following $p \Rightarrow [(p \vee r) \wedge \sim (p \Leftrightarrow \sim r)]$
10. Expand $\cos^6\theta$ and $\cos^5\theta$ in series of cosines of multiples of θ.
11. If cosα cosβ = cosϕ; sin α sinβ = sinϕ then prove that sinϕ = $\pm sin^2\alpha = \pm sin^2\beta$.
12. (i) find the Laplace transform of (sin at - atcosat).
    (ii) Find L($\sin^3$2t)
13. Find the inverse Laplace Transform of $\frac{1}{3-4s} + \frac{3-2s}{s^2+49}$

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