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.Mathematics - END SEMESTER EXAMINATIONS - NOV'2024
SEMESTER - IV
20UPHAT4004 - Allied Mathematics - II

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

Section B

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

1. Find the fourier series for $f(x)$ in $-\pi < x < \pi$ if $f(x)= \begin{cases} -a, & -\pi < x < 0 \\ a, & 0 < x < \pi \end{cases}$.
2. Solve $z^2(p^2 + q^2 + 1) = 1$.
3. Find $L(sinat)$.
4. Find the Laplace transform of $t^2 cos\ at$.
5. Solve $\dfrac{\partial^2 z}{\partial x \partial y} = x^2 + y^2$.
6. Solve $p = (1 + q^2)y^2$
7. Find the laplace transform of f(t) if $f(t) = \begin{cases} e^{-t}, & 0 \leq t \leq 4, \\ 0, & 4 < t < \infty \end{cases}$.
8. Find $L\left(\dfrac{cosat - cosbt}{t}\right)$.

Section C

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

9. Find the fourier series for the function $f(x) = x^2$ in $-\pi \leq x \leq \pi$.
   Also deduce that $\dfrac{1}{1^2} + \dfrac{1}{3^2} + \dfrac{1}{5^2} + \dfrac{1}{7^2} + ... = \dfrac{\pi^2}{8}$.
10. Eliminate f and ϕ from $z = f(x + ay) + \phi(x - ay)$.
11. Solve $x(y - z)p + y(z - x)q = z(x - y)$.
12. Find the Laplace transforms of the following
    a) sin2t sint. b) sin3t sint.
13. Find the Laplace Transform of $e^{-t} \int_0^t \dfrac{sint}{t}\ dt$.

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