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. Physics - END SEMESTER EXAMINATIONS APRIL - 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 the function f(x) = e^x in (-π, π).
2. Form a partial differential equation by eliminating the constants 'a' and 'b' from The equation z = (x+a)(y+b).
3. Solve $\frac{\partial^2 z}{\partial x^2} = \sin x$.
4. Solve xp+ p^2= q.
5. Solve the equation p^2+q^2 = x+y.
6. Find $L(e^t + \frac{1}{e^t})^2$.
7. Evaluate L(e^{-3t} sint cost).
8. If f(t) = e^{-2t} sin2t, find $L[f'(t)]$.

Section C

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

9. Find the Fourier series for f(x) in $-\pi < x < \pi$ if
$f(x) = \left\{ \begin{array}{ll} -a, & -\pi < x < 0 \\ a\ , & 0 < x < \pi \end{array} \right\}$.
10. Eliminate the arbitrary functions f_1 and f_2 from the equation z= f_1(x+y) +f_2(x-y).
11. Solve the equation xp+zq = y.
12. Find the Laplace transforms of (i) cos(at+b) (ii) sin(2t+3).
13. Show that
(i) $L(\cos at - \frac{1}{2} at\ sinat) = \frac{S^3}{(S^2+a^2)^2}$.
(ii) $\left[\frac{1}{2}(sinat - atcosat)\right] = \frac{a^3}{(S^2+a^2)^2}$.

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