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.AI - END SEMESTER EXAMINATIONS - NOV'2024
SEMESTER - II
22UAIAT2002 - Allied Mathematics - II

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

Section B

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

1. Evaluate $\int x^4 cosx dx$.
2. Find the Fourier series for sin^3x in [0,2π].
3. Find the Fourier series for $f(x)$ in (-π,π) if
   $f(x) = 0$ -$\pi < x < 0$,
   $f(x) = \pi$ $0 < x < \pi$
4. Solve $(D^2 + 5D + 4)y = 0$.
5. Solve $(D^2$ - $4D + 13)y = e^{2x}\ cos3x$.
6. Eliminate the arbitrary function f from $f(xy + z^2, x + y + z) = 0$.
7. Solve $pq + p + q = 0$.
8. Find the Laplace transform of L$(t^2\ cosat)$.

Section C

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

9. Derive the reduction formula for $\int sin^n x dx$.
10. Find the Fourier series for the function $x + x^2$ in (-π, π).
    Deduce that $\frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + ... = \frac{\pi^2}{12}$.
11. Solve $(D^2 + 3D + 2)y = e^{-2x} + sinx$.
12. Solve the equation $(x^2 - y^2 - z^2)p + 2xyq = 2zx$.
13. (i) Show that $L(cosat - \frac{1}{2}\ atsinat) = \frac{s^3}{(s^2 + a^2)^2}$.
    (ii) Evaluate $L(e^t cos^3 t)$.

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