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.(Chemistry) - END SEMESTER EXAMINATIONS APRIL-2023
SEMESTER - II

20UCHAT2002 - Allied Mathematics II

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

Section B

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

1. Determine the Fourier series for $f(x) = \left(\frac{\pi - x}{2}\right)$ in [-π,π].
2. Find the Laplace transform of $t\cos^2 t$.
3. Evaluate $L^{-1}\left[\frac{4s+5}{(s-1)^2(s+2)}\right]$
4. Determine curl F if F $= x^2y\bar{i} + y^2z\bar{j} + z^2x\bar{k}$.
5. Eliminate the arbitrary function f from $f(xy + z^2, x + y + z) = 0$.
6. Find the Laplace transform of $\frac{sinat}{t}$.
7. Determine the inverse Laplace of $\frac{a+bs}{s^3}$.
8. Determine $\oint_c xdx + ydy$, where C is the ellipse $x^2 + 4y^2 = 4$.

Section C

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

9. Determine the fourier series for $f(x) = \begin{cases} -x+1 & -\pi \le x \le 0 \\ x+1 & 0 \le x \le \pi \end{cases}$
10. Solve $\left(\frac{x}{p}\right)^n + \left(\frac{y}{q}\right)^n = z^n$
11. Show that $L\left(\frac{e^at - cosbt}{t}\right) = \frac{1}{2}log\left(\frac{s^2+b^2}{(S-a)^2}\right)$.
12. Determine the inverse laplace of $\left(\frac{4s^2 - 3s + 5}{(s+1)(s-1)(s-2)}\right)$.
13. Verify Greens theorem for $\oint_C$ (3x^2 - 8y^2)dx + (4y - 6xy)dy. Where C is the boundary of the region enclosed by the parabolas $x^2 = y$ and $y^2 = x$.

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