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. END SEMESTER EXAMINATIONS APRIL-2022
SEMESTER - II
20UCHAT2002 - ALLIED MATHEMATICS II

Total Duration : 3 Hrs. **Total Marks : 60**

Section A

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

1. Find the Fourier's series for the function f(x) $= x^2$ in (0, 2π).
2. Find L $[e^{7t} \sin 2t]$.
3. Find $L^{-1}\left[\frac{s+2}{(s^2+4_s+5)^2}\right]$.
4. If ϕ(x, y, z) $= 3x^2y - y^3z^2$ find $\nabla\phi$ at the point (1, – 2, 1).
5. Solve : $p^2 + q^2 =$ z.
6. If L $[f(t)] =$ F(s) then prove that L $[f(at)] = \frac{1}{a}$ F $\left(\frac{s}{a}\right)$.
7. Find $L^{-1}\left[log\left(\frac{s+1}{s-1}\right)\right]$.
8. If $\overrightarrow{F} = x^2\overrightarrow{i} +$ xy $\overrightarrow{j}$, evaluate $\int \overrightarrow{F}.\overrightarrow{dr}$ from (0, 0) to (1, 1) along the line $y^2 =$ x.

Section B

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

9. If f(x)$=\begin{cases} -\frac{\pi}{4} & -\pi < x < 0 \\ \frac{\pi}{4} & 0 < x < \pi \end{cases}$ then find the Fourier's Series And Deduce that $\frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \ldots\ldots = \frac{\pi}{4}$.
10. Solve :$(3z–4y)$ p + $(4x–2z)$ q = 2y – 3x.
11. Find (i) L [sin3t cos2t], (ii) L $[t^2 +$ 2t + 3].
12. Find $L^{-1}\left[\frac{4s+3}{s(s+1)(11_s+6)}\right]$.
13. Verify Green's theorem for $\int_c[(x^2+y^2)dx - 2xydy]$ in the rectangular region in the xy - plane bounded by the lines x = 0, x = a, y = 0, y = b.

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