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 NOVEMBER -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. Define Fourier Series in the interval (0, 2π), and also write the Dirichlets condition in Fourier Series.
2. Find Fourier Series for the function f(x) = x^2 defined in the interval (-π, π).
3. Solve $z = px + qy + \sqrt{1 + p^2 + q^2}$.
4. Form partial differential equation by eliminate the arbitrary function from z = f(x^2+y^2).
5. Define Laplace transform with an example and write any two properties of Laplace transform.
6. Predict the value of L($\sin^2$(2t)).
7. Calculate $L^{-1}\left[\frac{1}{(s+2)^2+16}\right]$
8. Find the directional derivative of ϕ (x, y, z) = x y^2 + y z^3.

Section C

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

9. Express $f(x) = \frac{1}{2}(\pi - x)$ as Fourier series with period 2π, to be valid in the interval 0 to 2π.
10. Determine the general solution of (y+ z)p+(z+x)q = x+y.
11. Evaluate L(t e^{-t} sin t).
12. Evaluate $L^{-1}\left[\frac{1}{s(s+1)(s+2)}\right]$
13. Prove that F = (y^2 cos x + z^3)i + (2y sin x - 4)j + (3x z^2 + 2)k is irrotational and find its scalar potential.

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