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-2023
SEMESTER - II
16UCHAT2MA2 - 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 Transform of f(x)=x^2 defined on [-π,π]
2. Find L[t^2 e^{3t} $\sinh t$]
3. Evaluate $L^{-1}\left[log\frac{s+a}{s+b}\right]$
4. Compute $\nabla.\overrightarrow{F}$ and $\nabla\times\overrightarrow{F}$ at the Point (1,-1,1)for the function $\overrightarrow{F}= xz^3\overrightarrow{i}$ -$2x^2yz\overrightarrow{j}$ + $2yz^4\overrightarrow{k}$
5. Solve : zpq = p+q.
6. Find the Laplace transform of e^{-t} $\int_0^t$ tcostdt.
7. Find the Inverse Laplace transform of $\frac{1}{s(s+1)^2}$
8. If $\overrightarrow{F}$ =$xz\overrightarrow{i}$ + $yz\overrightarrow{j}$ + z^2k, then Evaluate $\int_c \overrightarrow{F}.\overrightarrow{dr}$ from the point (0, 0, 0) to (1, 1, 1) where C is the curve given by $x = t$, $y = t^2$ and $z = t^3$.

Section C

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

9. Find the Fourier Series of f(x)= $\begin{cases} x & 0 \le x \le \pi. \\ 2\pi - x & \pi \le x \le 2\pi \end{cases}$
10. Solve:(y-z) p + (z-x) q = x-y
11. Find the Laplace transforms of
    i) e^t $\cos^3 t$
    ii) $\frac{coshat - coshbt}{t}$
12. Evaluate $L^{-1}\left[\frac{5s+3}{(s-1)(s^2+2s+5)}\right]$
13. Verify Green's Theorem for $\oint_c (3x^2-8y^2)dx(4y-6xy)dy$ Where C is the boundary of the region bounded by the parabolas $x^2 = y$ and $y^2 = x$.

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