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.Statistics - END SEMESTER EXAMINATIONS - NOV'2024
SEMESTER - II
20USTAT2002 - 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 real valued function and prove that sum and product of two real valued function with same domain is real valued function.
2. Prove that Cantor set is equivalent to [0, 1].
3. Explain about convergent and divergent series with suitable example.
4. Compute the Laplace Transform of $f(t) = sin(2t)$.
5. Does the series $\sum_{n=1}^{\infty} log(1 + 1/n)$converges.
6. Identify the sequence $\{sinn\}_{n=1}^{\infty}$ is monotone or not.
7. Prove that $\{n - 1/n\}_{n=1}^{\infty}$ does not have a limit.
8. State and prove linear property and hence find the Laplace Transform of $f(t) = 3t + 2e^{-2t}$ using the linearity property.

Section C

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

9. Prove that the countable union of countable set is countable.
10. Show that the sequence $\{(1 + 1/n)\}_{n=1}^{\infty}$ is convergent.
11. Prove that the series $\sum \frac{1}{n}$ is divergent for $n = 1$ to ∞.
12. Derive the Laplace Transform of
    (i) f(t) = 1 (ii) t^n (iii) sinh 2t.
13. Compute the Laplace Transform of $f(t) = e^{3t}\ cos(2t)$.

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