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Class Roll No.....

[Total No. of printed pages: 1]
Enrollment No.....

LNCT UNIVERSITY, BHOPAL

B.Tech I Semester(Mid Sem.First)-DEC..2024

Advance Calculus ,BT-102(CSE\AIML)

(Max. Marks: 20)

Time:1h30m

Note: Attempt all questions. Internal choices are given.

Q1 . Expand $\tan x$ by Maclaurin's Theorem as far as term x^5 Find $\tan 46.30'$ up to three places of decimal. (CO 1)

OR

Expand $\log_e x$ in powers of $(x - 1)$ and hence evaluate $\log_e 1.1$ correct to four decimal places. (CO1)

Q2. Verify Rolle's Theorem for the function $f(x) = \frac{\sin x}{e^x}$, Interval $(0, \pi)$. (CO1)

OR

Find the maximum value of u where $u = \sin x + \sin y + \sin(x + y)$. (CO1)

Q3. Evaluate $\lim_{n \rightarrow \infty} \left[\left(1 + \frac{1}{n}\right) \left(1 + \frac{2}{n}\right) \dots \left(1 + \frac{n}{n}\right) \right]^{\frac{1}{n}}$ (CO2)

OR

Evaluate $\int_0^{\infty} x^8 \frac{(1-x^6)}{(1+x)^{24}} dx$ (CO2)

Q4. Evaluate $\int_0^3 (x^2 + 2) dx$ as a limit of sum. (CO2)

OR

Express $\int_0^1 x^m (1 - x^n)^p dx$ in terms of Gamma function and hence evaluate $\int_0^1 x^5 (1 - x^3)^{10} dx$. (CO2)