Class: BCS 4(A, B, C) | Instructor: Dr. Usman Ashraf
Time Allowed: 90 minutes | Max Marks: 25
Name: _____ | Registration #: _____

(Marks: 3+3+4+4+4+4+3)

Q. 1. Find the Maclaurin series of e^x.

Q. 2. Determine whether the series $\sum_{n=1}^{\infty} \frac{\arctan n}{n^2}$ is convergent or divergent.

Q. 3. Evaluate the limit of the sequence $\{\frac{n^2}{2n-1} - \frac{n^2}{2n+1}\}$ if it is convergent.

Q. 4. Find the sum of the series $\frac{1}{4 \cdot 5} + \frac{1}{5 \cdot 6} + \ldots\ldots + \frac{1}{(n+3)(n+4)} + \ldots\ldots$ if it is convergent.

Q. 5. Evaluate the integral $\int x\sqrt[3]{x+9}\,dx$.

Q. 6. Evaluate the integral $\int \frac{5x-12}{x(x-4)}dx$.

Q. 7. Evaluate the integral $\int \frac{\sec^2 x}{(1+\tan x)^2}dx$.

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