

King Saud University
Department Of Mathematics
M-203
(Differential and Integral Calculus)

First Mid-Term Examination
(I-Semester 1432/33)

Max. Marks: 20

Time: 90 Minutes

Q. No: 1 Determine whether or not the sequence $\left\{ \left(1 - \frac{1}{n}\right)^n \right\}_{n=1}^{\infty}$ converges, and if it converges find its limit.....[3]

Q. No: 2 Determine whether the following infinite series converges or diverges. If it converges, find its sum

$$\sum_{n=1}^{\infty} \left[\frac{2^n + 3^n}{6^n} \right] \dots\dots\dots[3]$$

Q. No: 3 Determine whether the following series converges or diverges

$$\sum_{n=1}^{\infty} n e^{-n^2} \dots\dots\dots[4]$$

Q. No: 4 Use the first two non-zero terms of the power series representation of the function $f(x) = \frac{1}{1+x^3}$, $|x| < 1$ to approximate the value of $f(0.1)$.
..... [3]

Q. No: 5 Find the interval of convergence and radius of convergence of the

power series $\sum_{n=1}^{\infty} (-1)^n \frac{(x-1)^n}{n 2^n}$ [4]

Q. No: 6 Find Maclaurin series for $f(x) = \cos x + \sin x$ [3]