

28-3-2018



DOON UNIVERSITY, DEHRADUN
Mid Semester Examination, 2nd Semester, 2018
Academic Year 2017-18 (Even Semester)
School of Technology
M.C.A
MCC-203 Numerical and Statistical Computing

Time Allowed 2.00 Hours

Maximum Marks: 30

SECTION : A

Attempt all the questions. All questions carry equal marks. (3+3)

Q.1) Define with suitable example:

1. Relative error.
2. Round-off errors.
3. Truncation errors.

Q.2) Answer the following questions:

1. Write down the formula of linear approximation near $x=a$.
2. Find the linear approximation of square-root near $x=4$.
3. Approximate square root of 4.1.

SECTION : B

Attempt all the questions. All questions carry equal marks. (4+4+4)

Q.1) Determine the number of terms of the series $\sum_{n=1}^{\infty} (-1)^n / n^2 + n$ that are needed to be computed in order for the sum of the series to have an error less than 0.001.

Q.2) A company manufactures ball bearings with radius of 1.2 millimeter varying by ± 0.1 millimeters. What is the volume of ball bearings and by how much can it vary?

Q.3) Consider 5 digit chopping (all numbers are normalized) for $x = 1/3$, $y = 5/7$. Find the number of digits(t) to be rounded off for the sum $(x+y)$.

SECTION : C

Attempt all the questions. All questions carry equal marks. (6+6)

Q.1) Using $n=6$ evaluate $\int_1^7 (1/x^3+1)dx$ using:

1. Trapezoid rule.
2. Simpson's 1/3rd rule.

Q.2) Solve the equation $e^x - 4x = 0$ using Newton-Raphson iteration using $x_0 = 0.5$.