28-3-2018

DOON UNIVERSITY, DEHRADUN

Mid Semester Examination, 4th Semester, 2018

Academic Year 2017-18 (Even Semester)

School of Technology

Integrated M.C.A

TMC-254 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 $x_0=0.5$.