Roll No. 2061285 Paper Code: TCS-401

End Term (Back) Examination, Even Semester 2016-2017

B.Tech CSE IV

CBNST

Time: Three Hours MM: 100

Note:

(i) This question paper contains five questions.
(ii) All questions are compulsory.
(iii) Instructions on how to attempt a question are mentioned against it.
(iv) Total marks assigned to each question are **twenty**.

Q1. (Attempt any two questions of choice from a, b and c) (2X10=20 Marks)

a. What is Floating point arithmetic? Discuss Floating point representations and their pitfalls. Also describe "Normalization" along with some examples.

b. Find the root of the equation $x.e^x = \cos x$ using the Secant method correct up to four decimal places.

c. Give and explain rate of convergence of various iterative methods.

Q2. (Attempt any two questions of choice from a, b and c) (2X10=20 Marks)

a. What do you mean by finite differences? Explain various difference operators. Also give some (five) properties of forward difference operator.

b. Find the cubic polynomial which takes the following values:

x	0	1	2	3
f(x)	1	2	1	10

Hence or otherwise evaluate f(4).

c. Using Gauss-backward difference formula, find f(8) from the following table:

x	0	5	10	15	20	25
f(x)	7	11	14	18	24	32

Q3. (Attempt any two questions of choice from a, b and c) (2X10=20 Marks)

a. Find the value of the integral $\int_0^6 \frac{dx}{1+x^2}$ by using Trapezoidal Rule.

b. Find the value of y for x=0.1 by Picard's method, given that $\frac{dy}{dx} = \frac{y-x}{y+x}$ and y(0)=1.

c. What is numerical differentiation and numerical integration? Explain the various numerical integration methods. Also give applications of these types (both numerical differentiation and integration) of methods.

Q4. (Attempt any two questions of choice from a, b and c) (2X10=20 Marks)

a. What do you mean by "Curve Fitting"? Also explain "Methods of least squares". Give required mathematical formulas and expression in support of your answer.

b. Explain the term "Correlation and Scatter diagram". Also calculate the correlation coefficient between the following data:

x	5	9	13	17	21
y	12	20	25	33	35

c. Apply Solve the following equations using Gauss-Seidel method.

$$27x + 6y - z = 85$$
$$x + y + 54z = 110$$
$$6x + 15y + 2z = 72$$

Q5. (Attempt any two questions of choice from a, b and c) (2X10=20 Marks)

a. What do you mean by "Regression analysis"? Also describe Linear, Non-Linear and Multiple Regression using suitable expressions and example.

b. Explain method of moving averages using suitable example. Show each step of the method.

c. What do you understand from "Statistical Quality Control Methods"? Explain in detail along with few advantages of Statistical Quality Control Methods.