T1

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MANAV RACHNA UNIVERSITY

DEPARTMENT OF MATHEMATICS

"T1 Examination, AUG-2018"

Semester:3rd
Subject: Statistical & Numerical Techniques
Branch: CSE
Course Type: Core
Time: 90 Minutes
Program: B.Tech

Date of Exam:27/08/18
Subject Code:MAH208-T
Session: II
Course Nature: Hard
Max.Marks:30
Signature: HOD/Associate HOD:

Note: Part A: All questions are compulsory. Each Question carries 2marks. Part B: Attempt any two questions. Each Question carries (5+5) marks.

PART-A

Q1. (a) Define interpolation.

(b) What do you understand by intermediate value property of a continuous function. Demonstrate it graphically.

(c) Give Sterling's formula for interpolation.

(d) Using bisection method, Find a real root of t he equation $x^3 - x - 4 = 0$. Perform two iterations only.

(e).Form Backward difference table for the following data:

X	4	6	8	10
y	48	100	294	900

PART-B

Q2(a).Use Legrange's interpolation formula to find the form of f(x) from the following data:

X	0	2	3	6
f(x)	648	704	729	792

(b).Using Newton's forward interpolation formula, find f(22) from the following data:

x	20	25	30	35	40	45
f(x)	354	332	291	260	231	204

Q3(a).Find an approximate root of $x^4 - x - 10 = 0$ using Newton Raphson method correct to three decimal places.

(b).Using Regula Falsi method, find the approximate root of the equation $xe^x = \cos x$, upto three decimal places by performing four iterations only.

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Q4(a). Find the 1st and 2nd derivatives of f(x) at x=1.5 using the following data:

x	1.5	2.0	2.5	3.0	3.5	4.0
f(x)	3.375	7.000	13.625	24.000	38.875	59.000

(b). Using Newton's divided difference formula, find f(9) from the following table:

x	5	7	11	13	17
f(x)	150	392	1452	2366	5202

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