DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
UNIVERSITY INSTITUTE OF ENGINEERINGAND TECHNOLOGY, CSJM UNIVERSITY, KANPUR

Numerical Methods [CSE-3rd year][MTH-S-501]CSE

Semester: 2024-25 (Odd Semester) **Year: 3rd Year (2K22)**

Mid Semester Examination[Mid]

Time: 1.5 h **Maximum marks: 30**

PLEASE NOTE: All questions are compulsory

Section A

(9 questions of 1 mark each) [9X1=9]

Q1. Write any two applications numerical methods
Q2. Write any two examples of polynomial equation
Q3. Explain relative error by an example
Q4.Explain approximation by an example.
Q5. Explain Error propagation
Q6.If true value doesn't exists then how can we generate the result
Q7.Explain the purpose of round off
Q8. Explain any one issue related to root finding.
Q9.Explain accuracy by an example

Section B

(3 questions of 3 marks each) [3X3=9]

Q10. Explain absolute error by an example .

Q11 Explain secant method by using appropriate example

Q12. Find a root of the equation $x^3 - 4x - 9 = 0$, using bisection method correct to 3 decimal places

Section C

(2 questions of 6 marks each) [2X6]

Q13. Find a real root of the equation $x \log_{10} x = 1.2$ by regula-falsi or false position method correct to 4 decimal places.

Q14. Using bisection method, find the negative root of the equation $x^2 + \cos x - 2 = 0$.

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Numerical Methods [CSE-3rd year][MTH-S-501]CSE

Semester: 2024-25 (Odd Semester) **Year: 3rd Year (2K22)**

End Semester Examination

Time: 3 h **Maximum marks: 50**

Date 11-12-24 (IInd shift) copies 68

PLEASE NOTE: All questions are compulsory

Section A (10 questions of 1 mark each) [10X1=10]

Q1. Define approximation in numerical method
Q2. Write any two differences between Regression and Interpolation
Q3.Write any one method of Numerical Differentiation
Q4.Explain any one application of Numerical Integration.
Q5. Write formula for Forward Difference.
Q6.Explain relative error
Q7.Explain truncation error by an example
Q8. Explain any one issue related to direct method
Q9.Explain precision by an example
Q10.Write formula by Trapezoidal rule

Section B (5 questions of 4 marks each) [5X4=20]

Q11.With the help of appropriate interpolation formula, find from the following data the weight of a baby at the age of one year and of ten year

Age(Years)	3	5	7	9
Weight(Kg)	5	8	12	17

Q12. Analyse the backward difference. Give an appropriate example.

Q13. Find a real root of the equation $x^3 - 3x + 1$, by using bisection method, correct to 3 decimal places

Q14.Determine the interpolating polynomial for the following table of data

X	1	2	3	4
Y	-1	-1	1	5

Q15. Find the interpolating polynomial which takes the following values: y(0) = 1, y(0.1) = 0.9975, y(0.2) = 0.9900, y(0.3) = 0.9980. Hence, compute y (0.05).

Section C (2 questions of 10marks each) [2X10]

Q16. Compute values of ex at x = 0.02 and at x = 0.38 using suitable interpolation formula on the table of data given below.

X	0.0	0.1	0.2	0.3	0.4
e^x	1.0000	1.1052	1.2214	1.3495	1.4198

Q17.(a)Differentiate simpsons1/3rd and 3/8th rule

(b)Evaluate, $\int_0^1 e^{-x^2}$ **by using**

(i) Simpson's one-third rule with 10 subintervals and (ii) Trapezoidal rule.