



Tribhuvan University
Faculty of Humanities & Social Sciences
OFFICE OF THE DEAN
2025

Bachelor in Computer Applications
Course Title: Numerical Methods
Code No: CACS 252
Semester: IV

Full Marks: 60
Pass Marks: 24
Time: 3 hours

Candidates are required to answer the questions in their own words as far as possible.

Group B

Attempt any SIX questions.

[6×5 = 30]

2. What do you mean by true error? Find a positive root of equation $xe^x=1$, which lies between 0 and 1 using bisection method. [1+4]
3. What is interpolation? Given the following set of data points, obtained the table of divided difference. Use the table to estimate the value of $f(1.5)$ [1+4]

I	0	1	2	3	4
x_i	1	2	3	4	5
$f(x_i)$	0	7	26	63	124

4. Solve the following system of equations by Gauss elimination method. [5]

$2x+y+4z=12$

$8x-3y+2z=23$

$4x+11y-z=33$

5. The distance of motorbike at interval 2 minutes are given below:

Time(minutes)	0	2	4	6
Distance(Km)	0	1.5	3.8	6.7

Evaluate the velocity and acceleration of motorbike at time 2.37 and 4.57 minutes [2.5+2.5]

6. Write a program to compute value of y when $x=2$ such that $\frac{dy}{dx} = 3x^2+1$ with $y(1)=2$ and $h=0.25$ using Euler's method. [5]

7. Find the largest Eigen value and corresponding Eigen vector of the following matrix using power method. [5]

$$\begin{bmatrix} 1 & 2 & 0 \\ 2 & 1 & 0 \\ 0 & 0 & -1 \end{bmatrix}$$

8. Solve the Poisson equation $\nabla^2 f = 2x^2y^2$ over the square domain $0 \leq x \leq 3$ and $0 \leq y \leq 3$ with $f=0$ on the boundary and $h=1$. [5]

Group C

Attempt any TWO questions.

[2×10 = 20]

9. What do you mean by ill condition? Solve the following system using Jacobi iteration method.

$2a+b+c=5$

$3a+5b+2c=15$

$2a+b+4c=8$

[2+8]

10. How interpolation is differ from regression? Write down algorithm and program for Lagrange interpolation polynomial. [2+4+4]

11. What is fixed point iteration method? How it converge the root of non-linear equation? Find the root of equation $f(x) = x^2-3x+2$ using N-R method. [2+2+6]