TRIBHUVAN UNIVERSITY 24 INSTITUTE OF ENGINEERING

Examination Control Division

2069 Bhadra

Exam.	Regular (2066 & Later Batch)			
Level	BE	Full Marks	80	
Programme	BEL, BEX, BCT, B. Agri.	Pass Marks	32	
Year/Part	II / II	Time	3 hrs.	

Subject: - Numerical Method (SH553)

- Candidates are required to give their answers in their own words as far as practicable.
- Attempt All questions.
- The figures in the margin indicate Full Marks.
- Assume suitable data if necessary.

Generate forward difference table from the following data.

X	1	2	3	4	5	6
f(x)	2	9	28	65	126	217

- Explain the mechanism of finding a real root of a non-liner equation using secant method.
- Find a root of $e^x = 3x$ using bisection method and Newtons Raphson method correct upto 3 decimal places.
- Solve following system of linear equation using Gauss elimination method.

$$x + 2y + 3z = 6$$

 $2x + 3y + 5z = 10$

2x - y + 3z = 4

- Write Pseudo- code to solve a system of linear equations of 'N' unknowns using Gauss-Jordan method.
- Use Lagrange method to find f(2.5) from the following data:

x 1		2	4	5	7	
f(x)	di Io	1.414	1.732	2.00	2.6	

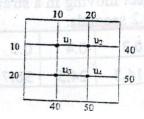
Fit the following set of data to a curve of the form $y = a e^{bx}$ from the following observation by least square method.

X	1	2	3	4	5	6
y	5.5	6.5	9.4	15.2	30.6	49.8

- Derive the expression of Simpson's 1/3 rule for integration.
- Evaluate: $\int_{2}^{4} e^{-x^{2}} dx$ using 2-point Gauss Legendre method.

Evaluate $\int_{1}^{2} e^{-x^{2}} dx$ using Romberg method correct up to 3 decimal places.

- Solve: y'' + xy' + y = 0; y(0) = 1; y'(0) = 0 for x = 0(0.1)0.2 using the RK2 method. [10]
- 11. Solve the elliptic equation $u_{xx} + y_{xx} = 0$ for the following square mesh with boundary conditions as shown in figure below.



[4]

[4+4]

[8]

[8]

[6]