1CSc. 204-2068IOST, TU **Downloaded from: http://www.bsccsit.com**

**Tribhuvan University**

**Institute of Science and Technology**

**2068**

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Bachelor Level/ Second Year/ Third Semester/Science Full Marks: 60

**Computer Science and Information Technology (CSc 204)** Pass Marks: 24

(Numerical Method) Time: 3 Hours

*Candidates are required to give their answers in their own words as far as practicable.*

The figures in the margin indicate full marks.

**Attempt all questions:**

1. Define the types of errors in numerical calculations. Derive the formula for secant method and illustrate the method by figure. **(4+4)**

2. Define the linear least squares approximations. Give the data set (xi, yi) as (20.5, 765), (32.7, 826), (51.0, 873), (73.2, 942), (95.7, 1032) find the linear least square to fit given data.

**(2+6)**

3. Evaluate ∫ using trapezoidal rule with n = 10. Also evaluate the same integral using Grossion 3 point formula and compare the result. **(4+4)**

4. Solve the following system of linear equations using Gauss-elimination method (use partial pivoting if necessary);

**(8)**

**OR**

What do you mean by eigen-value eigen-vector problems? Find the largest eigen value correct to two significant digits and corresponding eigen vectors of the following matrix using power method. [ ]

**(2+6)**

5. Write an algorithm and program to solve system of linear equations using Gauss-Jordan method. **(4+8)**

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6. Apply Runge Kutta method of second order and fourth order to find an approximate value of y when x = 0.2 given that

( )

**(8)**

7. How can you solve Laplace’s equation? Explain. The steady-state two dimensional heat flow in a metal plate is defined by

A steel plate of size 30 x 30cm is given. Two adjacent sides are placed at 100ºC and other side at held at 0ºC. Find the temperature at interior points, assuming the grid size of 10 x 10cm.

**(3+5)** 1CSc. 204-2067IOST, TU **Downloaded from: http://www.bsccsit.com**