First Year Examination of the Three Year

Degree Course, 2001

(Faculty of Science)

COMPUTER SCIENCE

Third Paper

(Computer Oriented Numerical Methods)

Time - Three Hours

Maximum Marks - 50

Attempt **FIVE** questions in all,

choosing **ONE** question from each unit.

UNIT-I

1. How a floating point number is stored in the memory of a computer? Discuss with examples the procedures of four basic arithmetic operations using normalized floating point numbers.   10

OR

2. What do you mean by roots of an equation? Discuss the successive bisection method of evaluating roots of a non-linear equation in one variable. Develop the algorithm of the method.   10

UNIT 2

3.. Discuss the Gauss Seidel method for the solution of simultaneous equations. What is Pivoting? Explain its use in Gauss Seidel Method. Give a comparision of direct and iterative methods.   2+4+4

OR

4. Discuss the Gauss elimination method of solving simultaneous linear equations. Develop the algorithm for the method.   4+3+3

UNIT 3

5. . Explain the Euler's method of solving ordinary differential equations. Develop the algorithm of the method. Discuss the error in the Euler's method.   10

OR

6. Using Runge-Kutta fourth order method find the solution of the following ordinary differential equation at x=0.4 the intial values are y=1 at x=0. Use the steps of size 0.2.   10

$$dx/dy = x + y^2$$

UNIT 4

7. What is difference table ? Construct a difference table from the following data and hence using the polynomial interpolation find the value of function f(x) at x= 2.0 :-

10

X	f (x)
-1.0	3.0
0.0	5.0
1.0	1.0
3.0	-1.0
1.0	13.0

OR

8. Discuss the method of approximating a function by using Chebyshev series. Use this method to approximate the series expansion of sin (x) for three digits accuracy.

10

UNIT 5

9 . Explain the method of numerical differentiation. Discuss the error in the differentiation formulae. Using this method find the differential of function f(x) at x = 1.3 from the following tabulated data :- 3+2+5

X	f(x)
1.0	0.0
1.2	0.365
1.4	0.673
1.6	0.940
1.8	1.176

OR

10. Explain the Simpson`s rule of numeric integration. What is the estimated error in this method ? Write the alogerithm for the simpson`s method. 10