Exam.Code:0029
Sub. Code: 0931

2041

Bachelor of Computer Application

Third Semester

BCA-16-304: Computer Oriented Numerical Methods

Time allowed: 3 Hours

Max. Marks: 65

NOTE: *Attempt five questions in all, including Question No. IX (Unit-V) which is compulsory and selecting one question each from Unit I - IV. Use of non-programmable calculator and log tables are allowed.*

x-x-x

UNIT – I

I. a) Discuss about floating point arithmetic with the help of suitable examples.

b) Discuss the measures of accuracy with suitable examples. (7,6)

II. a) Discuss Normalization and its consequences.

b) Discuss about the types of errors with the help of suitable examples. (7,6)

UNIT - II

III. a) What is a non-linear equation? What are the types of non-linear equations? What are the different methods used to solve non-linear equations? Discuss one iterative method to solve a non-linear equation.

b) Find root of the following equation using secant method: (7,6)

$$x^3 - 5x + 3 = 0$$

IV. a) Explain how to solve system of linear equations using Gauss Jorden method with the help of an example.

b) Discuss the convergence of Newton Raphson method. (7,6)

UNIT - III

V. a) Discuss about finite differences and difference tables with the help of suitable examples.

b) For the given table of values, find y(33) (7,6)

x	20	25	30	35
y(x)	0.34	0.42	0.5	0.65

P.T.O.

VI. a) Derive Newton's forward difference interpolation formula.

b) Derive Simpson's 3/8 rule. (7,6)

UNIT - IV

VII. a) How to approximate a function using Chebyshev polynomials.

b) How to solve ordinary differential equation using Runge-Kutta 2^{nd} order and 4^{th} order methods? Discuss geometric interpretation of both the methods. (7,6)

VIII. How to approximate a function using Taylor Series representation.

b) Solve the following differential equation using Modified Euler's method in the interval [0, 0.3] using step size h = 0.1 and y(0) =0: dy/dx = x + y (7,6)

UNIT - V

IX. Attempt the following:-

a) What do you understand by signed representation of an integer? Give example. (3)

b) How to find 2's complement of a binary number? Give example. (2)

c) Give the convergence of Bisection method. (2)

d) What is pivoting? Give example. (2)

e) Give the formula used in Lagrangian Interpolation. (2)

f) What do you understand by multiple step methods in solving ordinary differential equations? (2)

x-x-x