

# Bankura University

## Undergraduate FIFTH SEMESTER EXAMINATIONS, 2021

**Subject: Computer Science**

**Course ID: 51516**

**Course Title: Numerical Methods**

**Full Marks: 25**

**Time: 1hr 15 mins**

**The figures in the margin indicate full marks**

**Answer all the questions.**

### UNIT I

**1. Answer *any five* of the following questions: (5×1=5)**

- a) What is computer arithmetic?
- b) Express floating-point numbers in general form
- c) What do you mean by the order of a method?
- d) What is the convergence rate of Newton-Raphson method?
- e) What do you mean by iteration?
- f) Name two methods used for numerical integration.
- g) Distinguish between the first and second order derivatives
- h) Distinguish between interpolation and extrapolation

### UNIT II

**2. Answer *any two* of the following questions: (2×5=10)**

- a) Write a short note on different types of errors occurred in numerical analysis
- b) Discuss any one method for numerical integration
- c) Name a method for solving ordinary differential equations and write the algorithm
- d) Using Newton-Raphson method, find the positive root of the following equation correct up to 4 places after the decimal:  $x^2 = 7$

### UNIT III

3. Answer *any one* of the following questions:

(1×10=10)

- a) Discuss the Lagrange's interpolation method with an example.
- b) Using Gaussian elimination method solve the following system of linear equations:

$$\begin{aligned} X+Y+Z &= 6 \\ X+2Y-3Z &= -4 \\ 4X+5Y+Z &= 17 \end{aligned}$$