

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Course: B. Tech. Branch: Electronics & Telecom./EXTC (Sandwich) Semester: IV

Subject Code & Name: BTETPE405A/ BTEXPE405A Numerical Method & Computer Programming

Max Marks: 60

Date: 27/08/2022

Duration: 3.45 Hr.

Instructions to the Students:

- All the questions are compulsory.
- The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in () in front of the question.
- Use of non-programmable scientific calculators is allowed.
- Assume suitable data wherever necessary and mention it clearly.

- Q.1 Solve Any Two of the following.** (Level/CO) Marks
- A) An approximate value of x is given by $X_1 = \frac{22}{7} = 3.142857$ and its true value is $X = 3.1415926$ find the absolute and relative errors. **CO-1 6**
- B) Three approximate values of the number $\frac{1}{3}$ are given as 0.30, 0.33, 0.34 which of these three is the best approximation? **CO-1 6**
- C) Evaluate the sum $S = \sqrt{3} + \sqrt{5} + \sqrt{7}$ to 4 significant digits and find its percentage error? **CO-1 6**
- Q.2 Solve Any Two of the following.**
- A) Find a root of an equation $f(x) = x^3 - 3$ using Bisection method **CO-2 6**
- B) Find real root of the equation $x = e^{-x}$ using the Newtons Rapson method **CO-2 6**
- C) Find a root of an equation $f(x) = x^3 - x - 1$ using False Position method (Regula false method) **CO-2 6**
- Q.3 Solve Any Two of the following.**
- A) Find the polynomial $f(x)$ by using Lagrange's formula and hence find $f(3)$ for
- | | | | | |
|------|---|---|----|-----|
| x | 0 | 1 | 2 | 5 |
| F(x) | 2 | 3 | 12 | 147 |
- B) From the following table, estimate the number of students who obtained marks between 40 and 45 **CO-3 6**
- | | | | | | |
|----------------|-------|-------|------|-------|-------|
| marks | 40—50 | 50—60 | 60—0 | 30—40 | 30—40 |
| No of students | 31 | 42 | 51 | 35 | 31 |
- C) Using Gauss backward difference formula, find $y(8)$ from the following **6**

| | | | | | | |
|---|---|----|----|----|----|----|
| x | 0 | 5 | 10 | 15 | 20 | 25 |
| y | 7 | 11 | 14 | 18 | 24 | 32 |

CO-3

Q.4 Solve Any Two of the following.

A) Value of $f(x)$ in the interval $[0,4]$ are given

| | | | | | |
|------|---|----|----|----|----|
| x | 0 | 1 | 2 | 3 | 4 |
| F(x) | 3 | 10 | 21 | 36 | 55 |

CO-1 6

Using Simpson's 1/3 rule with the step size of 1. The value of $\int_0^4 f(x)dx = ?$

B) The value of solution $f(x)$ at 5 discrete points are given using trapezoidal

CO-1 6

rule with step size of 0.1. find all the value of $\int_0^{0.4} f(x)dx = ?$

| | | | | | |
|------|---|-----|-----|-----|-----|
| x | 0 | 0.1 | 0.2 | 0.3 | 0.4 |
| F(x) | 0 | 10 | 40 | 90 | 160 |

C) Determine the value of y when $x=0.1$ given that $y(0)=1$ and

CO-1 6

$\frac{dy}{dx} = x^2 + y$ $h=0.05$ using modified Euler's method

Q.5 Solve Any Two of the following.

A) Explain Basic concept of OOPS

CO-6 6

B) Explain data types in c++

CO-6 6

C) What is the basic structure of c++ program? Explain with example.

CO-7 6

*** End ***