

3E2014

Roll No. \_\_\_\_\_

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**3E2014**

**B. Tech III Sem. (Back) Exam. Jan. 2016**

**Civil Engineering**

**3CE4 (O) Computer Applications in Civil Engineering**

**Time: 3 Hours**

**Maximum Marks: 80**

**Min. Passing Marks: 24**

*Instructions to Candidates:*

*Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

*Units of quantities used/calculated must be stated clearly.*

*Use of following supporting material is permitted during examination.  
(Mentioned in form No. 205)*

1. NIL

2. NIL

**UNIT-I**

Q.1 (a) What is the role of approximations and round of errors in civil engineering?

Explain. [10]

(b) Explain truncation errors in detail. [6]

**OR**

Q.1 (a) What is the requirement of determination of roots and polynomials and transcendental equations by bisections in computation of civil engineering

applications? [10]

(b) Give algorithm for Secant and Bairstow's method. [6]

**UNIT-II**

- Q.2 (a) Explain successive substitution method with its derivation along with its algorithm. [12]  
(b) Write short note on linear algebraic equations. [4]

**OR**

- Q.2 (a) Derive and explain the formula for decomposition methods along with the algorithm. [10]  
(b) Explain various methods for the solutions of linear simultaneous linear algebraic equations. [6]

**UNIT-III**

- Q.3 (a) Explain the role of curve fitting and numerical differentiation in the civil engineering applications implementation in detail. [10]  
(b) Write short note on non – linear Regression analysis and its application areas. [6]

**OR**

- Q.3 (a) Explain various existing applications of difference relations in the solution of differential relations with appropriate example. [10]  
(b) What is the use of backward, forward and central difference relations in numerical differentiations? [6]

**UNIT-IV**

- Q.4 (a) Derive the expression for numerical integration using Simpson 1/8 rule. [8]  
(b) Give derivation for trapezoidal method for numerical integration and area under a curve. [8]

**OR**

- Q.4 Derive and explain the following.  
(a) Newton's method for integration. [8]  
(b) Simpson's 3/8 method. [8]

UNIT-V

- Q.5 (a) Explain numerical solution of ordinary differential equation by modified Euler method along with its derivation. [8]
- (b) Write a C program for Elliptic equation and explain. [8]

OR

- Q.5 Explain Elliptic equation and parabolic equations and their solution techniques in detail. [16]