

Roll No.

2268

B. E. 5th Semester (civil Engg.)

Examination – December, 2013

NUMERICAL METHODS & COMPUTING TECHNIQUES

'E' Scheme

Paper : CE-309E

Time : Three hours]

[Maximum Marks : 100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt any *five* questions.

1. Find by Newton-Raphson method, a root of the following equations correct to three decimal places :

(i) $x^4 - x = 10$

(ii) $3x = \cos x + 1$

2. (a) Solve the equations :

$$10x - 2y - 3z = 205, -2x + 10y - 2z = 154,$$

$$-2x - y + 10z = 120 \text{ by Relaxation method.}$$

(b) Apply Runge-Kutta fourth order method to find an approximate value of y when $x=0.2$, given that $\frac{dy}{dx} = x + y$ and $y = 1$ when $x = 0$

3. (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) By the method of least squares, find the straight line that best fits the following data :

x	:	1	2	3	4	5
y	:	14	27	40	55	68

4. Evaluate $\int_0^1 \frac{dx}{1+x}$ applying

(i) Trapezoidal rule

(ii) Simpson's $\frac{1}{3}$ rule

(iii) Simpson's $\frac{3}{8}$ rule

5. Differentiate between C and C++ languages also focus on Basic Object Oriented Concepts.

6. What is computer graphics ? Explain graphical user interfaces and GIS.

7. Write the formulation of problem of consolidation of soil layer, head loss due to friction water supply pipe network. Also, develop computer programming using C++

8. Write short notes on :

(i) Databases

(ii) Data structures

(iii) Seepage

(iv) Linear and polynomial regression.