Total No. of Questions : 5 Total No. of Printed Pages : 3

EI-193

B.E. (Vth Sem.) (CGPA) Civil Engg. Exam. 2015

NUMERICAL ANALYSIS

Paper : CE-501

Time Allowed : Three Hours
Maximum Marks : 60

Note : Attempt any two parts of each questions.
All questions carries equal marks.

Q.I (a) Write basic properties of flow chart with example.

(b) Explain different type of errors with example.

(c) Write an algorithm to interpolation the value of y at $x = a$, using Netwon's divided difference.

Q.II (a) Give the Geometrical represention of Newton's rapson's method.

(b) Find an approximate root of $x \log_{10} x - 1.2 = 0$ by false position method.

(c) By iteration method, find the value of $(48)^{\frac{1}{3}}$ correct to three decimal places.

Q.III (a) If $\sqrt{12500} = 111.803399$. $\sqrt{12510} = 111.848111$

$\sqrt{12520} = 111.892805$. $\sqrt{12530} = 111.937483$

find $\sqrt{12516}$ by Gauss's backward formula.

(b) State and prove Newton's backward interpolation formula.

(c) Find an approximate values of $\log_e 5$ by calculating to four decimal places by Simpson's $\frac{3}{8}$ rule the integral $\int_0^5 \frac{dx}{4x+5}$ dividing the range into 10 equal parts.

Q.IV (a) By using Euler's modified method, solve numerically the equation $\frac{dy}{dx} = x + |\sqrt{y}|$ with $y(0)=1$ for $0 \le x \le 0.6$ in step of 0.2.

(b) Compute $y(0.3)$ given $\frac{dy}{dx} + y + xy^2 = 0$ $y(0)=1$ by taking $h=0.1$ using R.K. forth order method.

(c) Determine the value of $y(0.4)$ using Milne's method given $y' = xy - y^2$. $y(0) = 1$

Q.V (a) Apply Gauss-seidal iterative method to solve the equation—

$$10x - 2y - 2z = 6$$
$$x + 10y - 2z = -7$$
$$-x - y + 10z = 8$$

(b) By the method of relaxation,

Solve $12x + y + z$
$$2x + 8y - z = 24$$
$$3x + 4y + 10z = 58$$

(c) By the method of triangularization solve the following system—

$$5x - 2y + 2 = 4$$
$$7x + y - 5z = 8$$
$$3x + 7y + 4z = 10$$

$$l_{31} u_{12} + l_{32} u_{22} = 7$$

Copies 100

$$l_{31} u_{13} + l_{32} u_{23} + u_{33} = 4$$