00328

No. of Printed Pages : 4

BICS-033

DIPLOMA – VIEP – COMPUTER SCIENCE AND ENGINEERING (DCSVI)

Term-End Examination

December, 2015

BICS-033 : NUMERICAL METHODS AND COMPUTATION

Time : 2 hours *Maximum Marks : 70*

Note : *Attempt any* ***five*** *questions. Question no.* ***1*** *is* ***compulsory.*** *All questions carry equal marks.*

1. Fill in the blanks by choosing the correct alternative. *7×2=14*

(a) Every polynomial equation of the n^{th} degree has _____ roots.

(i) n

(ii) n + 1

(iii) n + 2

(iv) n – 1

(b) If f(x) = 0 has a root between a and b, then f(a) and f(b) are of _____ signs.

(i) opposite

(ii) same

(iii) negative

(iv) positive

(c) The sum of deviation of the actual values of Y and the computed values of Y is _____ .

(i) 0
(ii) 1
(iii) maximum
(iv) minimum

(d) The relationship between E and Δ is _____ .

(i) $E = 1 + \Delta$
(ii) $E = 1 - \Delta$
(iii) $E = \Delta - 1$
(iv) $E = \Delta$

(e) In the function $Y = f(x)$, the dependent variable Y is called _____ .

(i) entry
(ii) argument
(iii) intermediate
(iv) interpolation

(f) Iteration method is a _____ method.

(i) direct
(ii) indirect
(iii) self-correcting
(iv) step-by-step

(g) The order of Newton-Raphson method is _____ .

(i) 1
(ii) 2
(iii) 3
(iv) 4

2. (a) Find the positive root of $x - \cos x = 0$ by bisection method. 7

(b) Find the positive root of

$f(x) = 2x^3 - 3x - 6 = 0$ by Newton-Raphson method, correct to five decimal places. 7

3. (a) Solve the following by method of Regula-Falsi : 7

$$x^3 + 2x^2 + 10x - 20$$

(b) Solve the following system of equations by Gauss elimination method : 7

$$2x + y + 4z = 12$$

$$8x - 3y + 2z = 20$$

$$4x + 11y - z = 33$$

4. (a) Solve the following system of equations by Gauss-Jordan method : 7

$$10x + y + z = 12$$

$$2x + 10y + z = 10$$

$$x + y + 5z = 13$$

(b) Solve the following system of equations by Gauss-Seidel method : 7

$$2x + y + z = 4$$

$$x + 2y - z = 4$$

$$x + y + 2z = 4$$

5. (a) Derive Newton's Forward interpolation formula. 7

(b) From the data given below, find the number of students whose weight is between 60 and 70 : 7

Weight in lbs :	0 – 40	40 – 60	60 – 80	80 – 100	100 – 120
No. of Students :	250	120	100	70	50

6. (a) Using Lagrange's interpolation formula, find y(10) from the following table : 7

x :	7	8	9	10
y :	3	1	1	9

(b) Applying Taylor series method, find the value of y(0·1), correct to four decimal places. Given $\frac{dy}{dx} = x^2 + y^2$ and y(0) = 1. 7

7. (a) Apply modified Euler method and obtain y(0·2). Given $\frac{dy}{dx} = y - x^2$, y(0) = 1. 7

(b) Find y(0·2), given $\frac{dy}{dx} = y - x$, y(0) = 2, taking h = 0·1 by Runge-Kutta method. 7

8. Explain any ***four*** of the following : $4 \times 3\frac{1}{2} = 14$

(a) Linear Regression

(b) Types of Error

(c) Golden Section Search

(d) Initial and Boundary Value Problems

(e) Picard's Method

(f) Brent's Method