Nepal College of Information Technology

**Assessment**

Fall 2014

Program : BE\_IT\_Day Time : 3 hrs

Semester : Fall FM : 100

Subject : Numerical Methods PM : 45

* *Candidates are requested to give their answer as far as practicable in their own words.*
* *The figure in the margin indicates the full marks*
* ***Attempt ALL question***

1. a) Solve ex Sin x – x2 = 0 by N-R method correct to three decimal place. [7]

b) Solve 3x + sinx – ex = 0 by secant method correct to four decimal place. [8]

2. a) The following are data from steam table:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Temp (t) | 140 | 150 | 160 | 170 | 180 |
| Pressure | 3.685 | 4.854 | 6.302 | 8.076 | 10.225 |

Using Newton’s formula, find the pressure of the steam when. [8]

b) The temperature of a metal strip was measured at various time interval during heating and values are given in the table below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Time, t (min) | 1 | 2 | 3 | 4 |
| Temp, (C) | 70 | 83 | 100 | 124 |

If the relationship between the temperature T and time t is of the form

T = b + a

Estimate the temperature at t = 3.5 min. [7]

3. a) Evaluate 

By Gaussian three terms formula [7]

b) Evaluate  by [8]

i) Trapezoid Rule

ii) Simpson’s Rule.

4. a) Solve

x+2y +z -w = -2

x+y+3z-2w =-6

2x+3y-z+2w=7

x + y +z +w =2

By Gauss elimination method. [7]

b) Solve

10x-2y-z-w = 3

-x-y+10z-2w = 27

-2x+10y-z-w = 15

-x-y-2z+10w =-9

By Gauss-seidal iteration method. [8]

5. a) Construct the Lagrange interpolation polynomial with the data in the following table [7]

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| x | -1 | 0 | 2 | 5 |
| f(x) | 10 | 7 | 7 | 22 |

b) Solve

ex-1-5x3=0 by Bisection method correct to two decimal places. [8]

6. a) Find the largest eigen value & corresponding eigen vector of the matrix

 [8]

b) Find the missing value from the following table [7]

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| x | 1 | 2 | 3 | 4 | 5 |
| y | 2 | 5 | 7 | - | 32 |

7. Write short notes on (Any two) 2\*5

a) Convergence of Newton-Raphson method.

b) Fitting of curve by least square approximation method

c) Ill condition system.