Nepal College of Information Technology

Assessment Exam

Level: Bachelor Year : 2013

Programme: BE ( Com/ IT) Full Marks : 100

Course: Numerical Methods Time : 3hrs.

*Candidates are required to give their answers in their on words as far as practicable. The figures in the margin indicate full marks*.

**Attempt All questions.**

|  |  |  |  |
| --- | --- | --- | --- |
| 1. | a. | Find the root of the equation  with accuracy 0.008, using False Position method. | 8 |
|  | b. | Calculate the root of non-linear equation using Newton Raphson method correct to 4 significant digits. | 7 |
|  |  |  |  |
| 2. | a. | Use appropriate method of interpolation to get  from given table.   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | x | 1 | 2 | 3 | 4 | 5 | 6 | | F(x) | 4 | 7.5 | 4 | 8.5 | 9.6 | 11 | | 8 |
|  | b. | Use the suitable method to fit a second order polynomial from following data:   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | x | -3 | -2 | -1 | 0 | 1 | 2 | 3 | | y | 4.63 | 2.11 | 0.67 | 0.09 | 0.63 | 2.15 | 4.56 | | 7 |
|  |  |  |  |
| 3. | a. | Evaluate the integral , Compare the result in both conditions for Gaussian 2 point and 3 point formula. | 10 |
|  | b. | The following data gives corresponding values of pressure ‘P’ and specific volume ‘V’ of steam engine.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | P | 105 | 42.7 | 25.3 | 16.7 | 13 | | V | 2 | 4 | 6 | 8 | 10 |   Find the rate of change of volume when pressure is 25.3. | 5 |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 4. | a.  b. | Using power method, find the largest Eigen value of the following matrix.  Solve the following linear equation by Gauss Seidal method. | 8  7 |
| 5. | a. | Solve the following differential equation within using RK 4th order method. , with and. (take h=0.25) | 8 |
|  | b. | Solve the Poission equation , over the square domain of  and  with  and | 7 |
|  |  |  |  |
| 6. | a. | Solve the differential equation  using Advanced Eulers method within with | 8 |
|  | b. | Use the suitable method and determine the exponential fit of for the following data:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | X | 1 | 2 | 3 | 4 | 5 | | Y | 1.2 | 2.5 | 6.25 | 15.75 | 28.65 | | 7 |
|  |  |  |  |
| 7. |  | Write short notes on (Any Two) (5×2) | 10 |
|  | a. | Errors in Numerical Methods |  |
|  | b. | Convergence/divergence of FPI method. |  |
|  | c. | Pivoting Techniques. |  |