**ASSIGNMENT\_I**

***“Computer Based Numerical & Statistical Techniques”***

1)**Round off** the following numbers correct to four significant digits:

***3.26425, 0.70035, 0.00032217, 3.14159***

2) If **true value*=10/3***, **approximate value*=3.33*** then find the **absolute** and **relative errors.**

3) What do you mean by **machine epsilon** of a computer?$$

4) If  ***u=5xy2/z3*** and error in ***x, y, z*** are ***0.001*** at ***x=y=z=1***; calculate maximum relative error in evaluating u.

5) Define the **Normalize floating-point arithmetic**. In case of normalized floating-point representation, associative and distributive laws are not always valid. Give examples to prove this statement.

6) What is the Convergence of fixed-point iteration method? Find a real root of the equation ***x3+x2-1=0*** on the interval ***[0, 1]*** with an accuracy of ***10-4*** by **iteration method.**

7) Find a quadratic factor of the polynomial ***x4+5x3+3x2-5x-9=0*** starting with ***p0=3,q0=-5*** by using **Bairstow’s** method.

8) To prove that the order of convergence of **Newton Raphson** method is **quadratic convergent**. Using **Newton Raphson** method, find the real root of the equation ***3x=cos x +1***, correct to four decimal places. Give computer programme using “c” language.

9) Explain the **Modified** **Newton Raphson** method.

10) Perform two iterations of the linear iteration method followed by one iterations of the **Aitken’s**$∆$**2 method** to find the root of the equation

***f(x)=x3-5x+1=0;X0=0.5***
11) The function ***y=f(x)*** is given at the points ***(7,3),(8,1),(9,1)*** and ***(10,9).*** Find the value of y for ***x =9.5*** using Lagrange’s interpolation formula.

12) Explain how we find error in Lagrange’s interpolation formula.

13) Use Newton‘s divided difference formula to find the interpolating polynomial and hence evaluate ***f(6), f(5) and f(8).***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***X:*** | ***3*** | ***7*** | ***9*** | ***10*** |
| ***f(x):*** | ***168*** | ***120*** | ***72*** | ***63*** |

14) Develop the divided –difference table from the data given below and obtain the interpolation polynomial ***f(x):***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ***x:*** | ***1*** | ***3*** | ***5*** | ***7*** | ***11*** |
| ***f(x):*** | ***5*** | ***11*** | ***17*** | ***23*** | ***29*** |