

ASSIGNMENT

B.Sc. Sem - VI (Numerical Analysis and Metric Space)

Paper - XVI

Group - A (Numerical Analysis)

- 1) Compute the real root of the equation $x \log_{10} x - 1.2 = 0$ by Regula Falsi Method correct upto three places of decimal.
- 2) Prove that if $f(x)$ be a polynomial of degree n in x then n th difference of $f(x)$ is constant and $\Delta^{n+1} f(x) = 0$.
- 3) By mean of Newton's divided difference formula, find the value of $f(8)$ and $f(15)$ from the following table
x: 4 5 7 10 11 13
f(x): 48 100 294 900 1210 2028

Group - B (Metric Space)

- 1) Define Metric space
Prove that if X be any non-empty subset of R then the function $d: X \times X \rightarrow R$ defined by
$$d(x, y) = \begin{cases} 0 & \text{if } x = y \\ 1 & \text{if } x \neq y \end{cases}$$
- 2) Let (X, f) be a metric space, then Prove that (X, d) be a metric space, where d is defined by
$$d(x, y) = \frac{f(x, y)}{1 + f(x, y)} \quad \forall x, y \in X.$$
- 3) Prove that an open sphere in a metric space (E, d) is an open set