

# SWARNACHUDA COLLEGE, MITRAPUR



**DEPARTMENT OF MATHEMATICS**

**SEMINAR ON**

Topic : **BISECTION METHOD**

**Presented by** : **Name - PRAGYAN PARAMITA CHAUDHRY**

**Class** : **+3 3RD Year Science**

**Roll No** : **BS -17-191**

**University Roll No** : **5613B17012**

**Guided by** : **Prof.Ratnakar raj**

**(Reader in Mathematics)**

**Prof.Ranjan Kumar Mishra**

**(Lect.in Mathematics)**



## Bisection Method

### Purpose of Bisection Method.

The Bisection method is used for the approximate root of a non linear algebraic & transcendental equation of the form  $f(x) = 0$

### Procedure of Bisection Method.

This method based on the repeated application of intermediate value theorem.

### Intermediate value Theorem

If  $f(x)$  is continuous in the interval  $[a, b]$  &  $f(a)$  and  $f(b)$  are of opposite signs, then there exists at least one point  $\alpha \in (a, b)$  s.t.  $f(\alpha) = 0$

Suppose  $a$  and  $b$  are two real numbers s.t.  $f(a) \cdot f(b) < 0$   
 $\Rightarrow$  the equation  $f(x) = 0$  has a root in  $(a, b)$

let us assume that  $f(a) < 0$  and  $f(b) > 0$

Now  $x_1 = \frac{a+b}{2}$

If  $f(x_1) = 0$ , we obtain a real root  $\alpha = x_1$

Otherwise the root lies in  $(a, x_1)$  or  $(x_1, b)$

according to  $f(a) f(x_1) < 0$  or  $f(x_1) f(b) < 0$

