

## Fibonacci series

$$F_n = F_{n-1} + F_{n-2} \quad (1)$$

where  $n > 1$

Fibonacci series is computed by the addition of two previous numbers from the current number;  
from the equation —(1)

we can write the intervals for  $n$ ;

$$0 \leq n \leq 1$$

$$F_0 = 0$$

$$F_1 = 1$$

from the eqn —(1) we say that the starting term in the series is  $F_0$

$$F_{n+1} = F_n + F_{n-1} \quad (2)$$

from the equation ....(2) it is known that the starting term in the Fibonacci series is  $F_1$  from the eqn (2) in the LHS  $F_{n+1}$ ;  $n$  is added with some constant  $c$ ; where  $c=1$ ; so the starting sequence is  $F_1$

gate question solution

$$F_{n+1} = F_n + F_{n-1}$$

$$F_6 = 37$$

$$F_7 = 60$$

$$F_1 = ?$$

solution: the terms in the Fibonacci series are:

$$F_1, F_2, F_3, F_4, F_5, F_6, F_7$$

the terms in the Fibonacci series are plotted only on the +ve x-axis scale; from  $[0 \text{ to } n]$  as  $n$  increases the point from the origin of the x-axis also increases; e.g: for  $n+1$  the terms will be in range  $[1 \text{ to } n+1]$  similarly for  $n+2$ ; the value will be incremented to 2 from origin i.e 0; so the range of terms will be  $[2 \text{ to } n+2]$

Note: Fibonacci series will have  $(n+1)$  terms

$(n+1)$ th term will hold the summation of all  $[0 \text{ to } n]$  terms for the equation (1)

for equation (2).. $F_{n+1} = F_n + F_{n-1}$

$n=n+1$ ; therefore, 0 is moved to so that the series contain exactly  $(n+1)$  terms

$F_1 = 4, F_2 = 5$ ; initialization of the first two terms;

$$F_{n+1} = F_n + F_{n-1}$$

$$F_{2+1} = F_2 + F_{2-1}$$

$$F_3 = 4 + 5 = 9$$

$$F_4 = 14$$

$$F_5 = 23$$

$$F_6 = 37$$

$$F_7 = 60$$