

TOPIC

Computers – Section IV – Question 7

QUESTION

Given the following algorithm

```
INPUT X, N
SUM = 1
FOR I = 2 TO N
SUM = SUM + X^I/N
NEXT I
PRINT SUM
```

The value of SUM that will be printed at the end of the loop is

- (A) $X + \frac{X^2}{2!} + \frac{X^3}{3!} + \dots + \frac{X^N}{4!}$
- (B) $\frac{X^2}{2} + \frac{X^3}{3} + \dots + \frac{X^N}{4}$
- (C) $\frac{X^2}{N} + \frac{X^3}{N} + \dots + \frac{X^N}{N}$
- (D) $1 + \frac{X^2}{N} + \frac{X^3}{N} + \dots + \frac{X^N}{N}$

HINT

Note the initial value of SUM and the denominator of the added term does not change.

SOLUTION

The SUM is initialized as 1, and the added term is X^I/N . So for the first value of $I=2$, it would be X^2/N , and for $I=3$, it would be X^3/N . Hence, the addition after 'I' takes the value of $I=N$, SUM would eventually turn out to be

$$\text{SUM} = 1 + \frac{X^2}{N} + \frac{X^3}{N} + \dots + \frac{X^N}{N}$$

ANSWER

(D)

CONTRIBUTOR

Autar Kaw