

**1 JEE Main 2020 (Online) 7th January Morning Slot**

Numerical

If the variance of the first  $n$  natural numbers is 10 and the variance of the first  $m$  even natural numbers is 16, then  $m + n$  is equal to\_\_\_\_\_.

**Answer**

Correct Answer is **18**

**Explanation**

$$\text{Variance } \sigma^2 = \frac{\sum x_i^2}{N} - \mu^2$$

variance of  $(1, 2, \dots, n)$

$$10 = \frac{1^2+2^2+\dots+n^2}{n} - \left(\frac{1+2+3+\dots+n}{n}\right)^2$$

on solving we get  $n = 11$

variance of  $2, 4, 6, \dots, 2m = 16$

$$\Rightarrow \frac{2^2+4^2+\dots+(2m)^2}{m} - (m+1)^2 = 16$$

$$\Rightarrow m^2 = 49$$

$$\Rightarrow m = 7$$

$$\therefore m + n = 18$$