

$$\textcircled{1} \lim_{n \rightarrow \infty} \left[ \frac{1}{n^2} + \frac{2}{n^2} + \dots + \frac{n}{n^2} \right]$$

Sol<sup>n</sup>:  $\lim_{n \rightarrow \infty} \frac{1}{n^2} [1 + 2 + \dots + n]$

$$\Rightarrow \lim_{n \rightarrow \infty} \frac{1}{n^2} \cdot \frac{n(n+1)}{2}$$

$$\Rightarrow \lim_{n \rightarrow \infty} \frac{(n+1)}{2n}$$

$$\Rightarrow \frac{1}{2} \lim_{n \rightarrow \infty} \left( 1 + \frac{1}{n} \right)$$

$$\Rightarrow \frac{1}{2} \left( 1 + \frac{1}{\infty} \right)$$

$$= \frac{1}{2}$$

Options

a)  $-\frac{1}{2}$

c)  $\frac{1}{2}$

b) 0

d) 1