

Ex-6: Find the value of $\sum_{i=0}^{\infty} \frac{i^2}{i!}$

$$\text{Sol: } \sum_{i=0}^{\infty} \frac{i^2}{i!} = \sum_{i=0}^{\infty} \frac{i^2}{i \times (i-1)!} = \sum_{i=1}^{\infty} \frac{i}{(i-1)!} = \sum_{i=1}^{\infty} \frac{i-1+1}{(i-1)!} = \sum_{i=1}^{\infty} \frac{1}{(i-1)!} + \sum_{i=2}^{\infty} \frac{1}{(i-2)!} = 2e$$