

Ex-4: Find the value of $\frac{1}{1!} + \frac{2}{2!} + \frac{3}{3!} + \dots$

$$\begin{aligned}\text{Sol: } \frac{1}{1!} + \frac{2}{2!} + \frac{3}{3!} + \dots &= \frac{1}{1!} + \frac{2}{2} + \frac{3}{3 \times 2!} + \frac{4}{4 \times 3!} + \dots \\ &= 1 + \frac{1}{1!} + \frac{1}{2!} + \frac{1}{3!} + \dots \\ &= e\end{aligned}$$