

Series :

$$(i) \quad u_n = \frac{(3n)!}{2^n (n!)^3}$$

$$(ii) \quad \left(\frac{n+a}{n+b} \right)^{n^2} \quad a, b > 0$$

$$(iii) \quad \frac{n}{\sqrt{n^4 + 1}} \quad (2 \text{ methods})$$

$$(iv) \quad \frac{1}{n (\log n)^2} \quad (n \geq 2)$$

$$(v) \quad \exp\left(\frac{(-1)^n}{n^\alpha}\right) - 1 \quad (\alpha \geq \frac{1}{2})$$

$$(vi) \quad \sin\left(\frac{(-1)^n}{n}\right)$$

$$(vii) \quad \sin\left(\sqrt{n^2 + 1} \pi\right)$$

$$(viii) \quad \left(1 + \frac{1}{\sqrt{n}}\right)^{-n}$$