# SEQUENCES AND SERIES

## SUM TO N TERMS OF SPECIAL SERIES

## EXERCISE

**Q1.** The sum of the infinite series $\frac{1}{2}\left(\frac{1}{3}+\frac{1}{4}\right)-\frac{1}{4}\left(\frac{1}{3^2}+\frac{1}{4^2}\right)+\frac{1}{6}\left(\frac{1}{3^3}+\frac{1}{4^3}\right)-\cdots$ is equal to.

(a) $\frac{1}{2}\log 2$ (b) $\log\frac{3}{5}$ (c) $\log\frac{5}{3}$ (d) $\frac{1}{2}\log\frac{5}{3}$

**Q2.** The sum of the infinite terms of the series $\frac{5}{3^2\times 7^2}+\frac{9}{7^2\times 11^2}+\frac{13}{11^2\times 15^2}+\cdots$ is

(a) $\frac{1}{18}$ (b) $\frac{1}{36}$ (c) $\frac{1}{54}$ (d) $\frac{1}{72}$

**Q3.** $\frac{\frac{1}{2}\cdot\frac{2}{2}}{1^3}+\frac{\frac{2}{2}\cdot\frac{3}{2}}{1^3+2^3}+\frac{\frac{3}{2}\cdot\frac{4}{2}}{1^3+2^3+3^3}+\cdots$ upto n terms is equal to

(a) $\frac{n-1}{n}$ (b) $\frac{n}{n+1}$ (c) $\frac{n+1}{n+2}$ (d) $\frac{n+1}{n}$

**Q4.** $(666\ldots.6)^2+(888\ldots.8)$ is equal to

(a) $\frac{4}{9}\left(10^n-1\right)$ (b) $\frac{4}{9}\left(10^{2n}-1\right)$ (c) $\frac{4}{9}\left(10^n-1\right)^2$ (d) None of these

**Q5.** The value of $(0.16)^{\log_{2.5}\left(\frac{1}{3}+\frac{1}{3^2}+\frac{1}{3^3}+\cdots\infty\right)}$, is

(a) 2 (b) 3 (c) 4 (d) None of these

**Q6.** Let $S_n=\frac{1}{1^3}+\frac{1+2}{1^3+2^3}+\cdots+\frac{1+2+\cdots+n}{1^3+2^3+\cdots+n^3}$, $n=1,2,3,\ldots$. Then $S_n$ is not greater than

(a) $\frac{1}{2}$ (b) 1 (c) 2 (d) 4

**Q7.** Fins the sum to n terms of the series $\frac{1}{1\times 2}+\frac{1}{2\times 3}+\frac{1}{3\times 4}+\cdots$

(a) $\frac{n}{n+2}$ (b) $\frac{n}{n+1}$ (c) $\frac{n+1}{n+2}$ (d) $\frac{n+2}{n+1}$

**Q8.** The value of $\frac{\sqrt{2}-1}{\sqrt{2}}+\frac{3-2\sqrt{2}}{4}+\frac{5\sqrt{2}-7}{6\sqrt{2}}+\frac{17-12\sqrt{2}}{16}+\cdots+\cdots+$ ad. inf., is

(a) $\log_e 2$ (b) $\log_e \sqrt{2}$ (c) $\log_e 3$ (d) $\log_e \sqrt{3}$

**Q9.** $1+\frac{3}{2}+\frac{5}{2^2}+\frac{7}{2^3}\ldots\ldots\infty$ is equal to

(a)3 (b)6 (c)9 (d)12

**Q10.** $\frac{1}{1.3}+\frac{1}{2.5}+\frac{1}{3.7}+\frac{1}{4.9}+\cdots$ is equal to

(a) $2\log_e 2-2$ (b) $2-\log_e 2$ (c) $2\log_e 4$ (d) $\log_e 4$

## ANSWER

**1.** (d)

**2.** (d)

**3.** (b)

**4.** (b)

**5.** (c)

**6.** (c)

**7.** (b)

**8.** (b)

**9.** (b)

**10.** (b)