All Branches Hinglish

Subject: Engineering Mathematics

DPP-07

Chapter: Calculus

Topic : Infinite Series

1. The summation of series,

$$S = 2 + \frac{5}{2} + \frac{8}{2^2} + \frac{11}{2^3} + ... + \infty$$

(a) 4.50 (b) 6.0

(c) 6.75 (d) 10.0

2. For $|x| \ll 1$, cot $h(x)$ can be approximated as

(a) x (b) x^2

(c) $\frac{1}{x}$ (d) $\frac{1}{x^2}$

3. For the function e^{-x}, the linear approximation around $x = 2$ is

(a) $(3 - x)\, e^{-2}$

(b) $1 - x$

(c) $[3 + 2\sqrt{2} - (1 + \sqrt{2})x]\, e^{-2}$

(d) e^{-2}

4. The limit of the following series as 'x' approaches $\frac{\pi}{2}$ is,

$$f(x) = x - \frac{x^3}{3!} + \frac{x^5}{5!} + \frac{x^7}{7!} + ...$$

(a) $\frac{2\pi}{3}$ (b) $\frac{\pi}{2}$

(c) $\frac{\pi}{3}$ (d) 1

5. sin x when expanded in powers of $\left(x - \frac{\pi}{2}\right)$ is

(a) $1 + \frac{\left(x-\frac{\pi}{2}\right)^2}{2!} + \frac{\left(x-\frac{\pi}{2}\right)^3}{3!} + \frac{\left(x-\frac{\pi}{2}\right)^4}{4!} + ...$

(b) $1 - \frac{\left(x-\frac{\pi}{2}\right)^2}{2!} + \frac{\left(x-\frac{\pi}{2}\right)^4}{4!} - ...$

(c) $\left(x - \frac{\pi}{2}\right)^2 + \frac{\left(x-\frac{\pi}{2}\right)^3}{3!} + \frac{\left(x-\frac{\pi}{2}\right)^5}{5!} + ...$

(d) None of these

6. The sum of the infinite series, $1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + ...$ is,

(a) π (b) infinity

(c) 4 (d) $\frac{\pi^2}{4}$

7. For $x = \frac{\pi}{6}$, the sum of the series

$\sum_1^\infty (cos\, x)^{2n} = cos^2 x + cos^4 x + ...$ is,

(a) π (b) 3

(c) ∞ (d) 1

8. The infinite series $1 + \frac{1}{2} + \frac{1}{3} + ...$

(a) converges (b) diverges

(c) oscillates (d) unstable

Answer Key

1. **(d)**
2. **(c)**
3. **(a)**
4. **(d)**
5. **(b)**
6. **(b)**
7. **(b)**
8. **(b)**