1. If t_n denotes the nth term of the series $2 + 3 + 6 + 11 + 18 + ...$ then t_{50} is
(A) $49^2 - 1$ (B) 49^2 (C) $50^2 + 1$ (D) $49^2 + 2$

2. Let $x = 1 + 3a + 6a^2 + 10a^3 + ...$ $|a| < 1$, $y = 1 + 4b + 10b^2 + 20b^3 + ...$ $|b| < 1$. Then $S = 1 + 3(ab) + 5(ab)^2 + ...$ in terms of x and y is

(A) $\frac{1+(1-x^{-1/3})(1-y^{-1/4})}{\{1-(1-x^{-1/3})(1-y^{-1/4})\}^2}$ (B) $\frac{1+(1+x^{-1/3})(1+y^{-1/4})}{\{1-(1+x^{-1/3})(1+y^{-1/4})\}^2}$

(C) $\frac{1+(1-x^{-1/3})(1-y^{-1/4})}{\{1+(1-x^{-1/3})(1-y^{-1/4})\}^2}$ (D) None of these

3. If $\frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + ...\text{upto } \infty = \frac{\pi^2}{6}$ then, $\frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + ...\infty =$

(A) $\frac{\pi^2}{6}$ (B) $\frac{\pi^2}{8}$ (C) $\frac{\pi^2}{4}$ (D) π^2

4. The sum of infinite terms of the series $\frac{1}{1+1^2+1^4}+\frac{2}{1+2^2+2^4}+\frac{3}{1+3^2+3^4}+...\infty$ is :

(A) $\frac{1}{2}$ (B) $\frac{1}{3}$ (C) 1 (D) $\frac{1}{4}$

5. The sum of the series $1.3^2 + 2.5^2 + 3.7^2 + ...$ upto 20 terms is
(A) 188090 (B) 180890 (C) 189820 (D) None of these

6. The sum of series $\frac{3}{1^2}+\frac{5}{1^2+2^2}+\frac{7}{1^2+2^2+3^2}+\frac{9}{1^2+2^2+3^2+4^2}+...$ to n terms equals

(A) $\frac{6n}{n+1}$ (B) $\frac{6n}{n^2+1}$ (C) $\frac{n+1}{n^2+1}$ (D) None of these

7. Sum to infinite of the series $1 + \frac{2}{5} + \frac{3}{5^2}+\frac{4}{5^3}+ ....$ is
(A) 5/4 (B) 6/5 (C) 25/16 (D) 16/9

8. The sum of the infinite series $\frac{1}{10}+\frac{2}{10^2}+\frac{3}{10^3}+...$ is equal to :

(A) $\frac{1}{9}$ (B) $\frac{10}{81}$ (C) $\frac{1}{8}$ (D) $\frac{17}{72}$

9. The sum of the series, $1+2\cdot\left(1+\frac{1}{n}\right)+3\cdot\left(1+\frac{1}{n}\right)^2+.... \infty$ is (where $|n| > 1$).

(A) n^2 (B) $n(n + 1)$ (C) $n\left(1+\frac{1}{n}\right)^2$ (D) $(n + 1)(n + 2)$

10. Sum of infinite terms of the series $\left[\frac{1}{5}-\frac{2}{7^2}+\frac{3}{5^3}-\frac{4}{7^4}+.....\right]$ is

(A) $\frac{211}{1152}$ (B) $\frac{220}{1811}$ (C) $\frac{2}{311}$ (D) None of these.

11. If the sum to infinity of the series $1 + 4x + 7x^2 + 10x^3 + ...$ is $\frac{35}{16}$ then find x.

(A) $\frac{1}{5}$ (B) $\frac{19}{7}$ (C) $\frac{15}{12}$ (D) None of these

12. The sum of $0.2 + 0.004 + 0.00006 + 0.0000008 + ...$ to ∞ is

(A) $\frac{200}{891}$ (B) $\frac{2000}{9801}$ (C) $\frac{1000}{9801}$ (D) None of these

13. The sum of the series $\frac{1}{\log_2 4}+\frac{1}{\log_4 4}+\frac{1}{\log_8 4}+....+\frac{1}{\log_{2^n} 4}$ is

(A) $\frac{n(n+1)}{2}$ (B) $\frac{n(n+1)+(2n+1)}{12}$ (C) $\frac{1}{n(n+1)}$ (D) $\frac{n(n+1)}{4}$

14. The sum to infinity of the series $\frac{1}{2.4}+\frac{1}{4.6}+\frac{1}{6.8}+\frac{1}{8.10}+$ .....is

(A) 1/4 (B) 1/8 (C) 1/2 (D) 1/16

15. The sum of $\frac{3}{1.2}\cdot\frac{1}{2}+\frac{4}{2\cdot 3}\cdot\left(\frac{1}{2}\right)^2+\frac{5}{3\cdot 4}\left(\frac{1}{2}\right)^3+\cdots$ to n terms is equal to

(A) $1-\frac{1}{(n+1)2^n}$ (B) $1-\frac{1}{n\cdot 2^{n-1}}$ (C) $1+\frac{1}{(n+1)2^n}$ (D) none of these

16. The value of $\sum_{n=3}^{\infty}\frac{1}{n^5-5n^3+4n}$ is equal to

(A) $\frac{1}{120}$ (B) $\frac{1}{96}$ (C) $\frac{1}{24}$ (D) $\frac{1}{144}$

17. The value of $\sum_{r=1}^{n}\frac{1}{\sqrt{a+rx}+\sqrt{a+(r-1)x}}$ is

(A) $\frac{n}{\sqrt{a}-\sqrt{a+nx}}$ (B) $\frac{\sqrt{a+nx}-\sqrt{a}}{x}$ (C) $\frac{n(\sqrt{a+nx}-a)}{x}$ (D) None of these

18. If the sum $\sum_{k=1}^{\infty}\frac{1}{(k+2)\sqrt{k}+k\sqrt{k+2}}=\frac{\sqrt{a}+\sqrt{b}}{\sqrt{c}}$ where a, b, c $\in$ N and lie in [1, 15], then a + b + c equals to

(A) 6 (B) 8 (C) 10 (D)11

19. The value of $\frac{1}{1.3.5}+\frac{1}{3.5.7}+\frac{1}{5.7.9}+\frac{1}{9.11.13}+...\infty$ equals

(A) $\frac{1}{12}$ (B) $\frac{53}{249}$ (C) $\frac{35}{429}$ (D) $\frac{35}{249}$

20. The value of $\sum_{k=1}^{\infty}\frac{6^k}{\left(3^k-2^k\right)\left(3^{k+1}-2^{k+1}\right)}$ is

(A) 1 (B) 2 (C) 3 (D) 4

Answers

RACE # 14

1.	(D)	**2.**	(A)	**3.**	(B)	**4.**	(A)	**5.**	(A)	**6.**	(A)	**7.**	(C)	**8.**	(B)	**9.**	(A)	**10.**	(A)
11.	(A)	**12.**	(B)	**13.**	(D)	**14.**	(A)	**15.**	(A)	**16.**	(B)	**17.**	(B)	**18.**	(D)	**19.**	(A)	**20.**	(B)