SEQUENCE AND SERIES

SINGLE CORRECT OPTION TYPE

1. If the first two terms of a H.P. are $\frac{3}{5}$ and $\frac{9}{10}$ respectively then the largest term of H.P. is

(A) 2^{nd} term (B) 3^{rd} term (C) 4^{th} term (D) none of these

2. If $\log_{10}x + \log_{10} y \geq 2$ then the smallest possible value of $x^2 + y^2$ is

(A) 200 (B) 2000 (C) 100 (D) none of these

3. If ab = 4a + 9b, a> 0, b> 0 then minimum value of $\sqrt{ab}$ is

(A) 13 (B) 14 (C) 12 (D) none of these

4. If in a series $t_n = \frac{n+1}{(n+2)!}$ then $\sum_{n=0}^{10} t_n$ is equal to

(A) $1-\frac{1}{10!}$ (B) $1-\frac{1}{11!}$ (C) $1-\frac{1}{12!}$ (D) none of these

5. The harmonic means of the roots of equation $(5+\sqrt{2})x^2-(4+\sqrt{5})x+8+2\sqrt{5}=0$ is

(A) 2 (B) 4 (C) 6 (D) 8

6. If $x^2 + 9y^2 + 25z^2 = 15yz + 5xz + 3xy$ then x, y, z are in

(A) A.P. (B) G.P. (C) H.P. (D) none of these

7. If $x_1^2 + x_2^2 + x_3^2 + \ldots + x_{50}^2 = 50$ and $\frac{1}{x_1^2 x_2^2 x_3^2 \ldots x_{50}^2} = A$ then

(A) $A_{minimum} = 1$ (B) $A_{maximum} = 1$ (C) $A_{minimum} = 50$ (D) $A_{maximum} = 50$

8. If *n* is an odd integer greater than or equal to 1 then the value of

$n^3-(n-1)^3+(n-2)^3-\ldots\ldots\ldots\ldots+(-1)^{n-1}1^3$ is

(A) $\frac{(n+1)^2(2n-1)}{4}$ (B) $\frac{(n-1)^2(2n-1)}{4}$ (C) $\frac{(n+1)^2(2n+1)}{4}$ (D) None of these

9. The H.M. of two numbers is 4 and their A.M. and G.M. satisfy the relation $2A + G^2 = 27$, then the numbers are :

(A) –3,1 (B) 5, –25 (C) 5, 4 (D) 3, 6

10. $\log_{\sqrt{3}} x+\log_{\sqrt[4]{3}} x+\log_{\sqrt[6]{3}} x+\ldots\ldots\ldots+\log_{\sqrt[16]{3}} x=36$ is

(A) $x=3$ (B) $x=4\sqrt{3}$ (C) $x=9$ (D) $x=\sqrt{3}$

11. The sum S_n to n terms of the series $\frac{1}{2}+\frac{3}{4}+\frac{7}{8}+\frac{15}{16}+\ldots$ is equal to

(A) 2^n-n-1 (B) $1-2^{-n}$ (C) $2^{-n}+n-1$ (D) 2^n-1

12. If the first, second and last terms of an A.P. are a, b and 2a respectively, then its sum is

(A) $\frac{ab}{2(b-a)}$ (B) $\frac{ab}{b-a}$ (C) $\frac{3ab}{2(b-a)}$ (D) none of these

13. If $5^{1+x}+5^{1-x}$, $\frac{a}{2}$ and 25^x+25^{-x} are three consecutive terms of an A.P., then the values of a are given by

(A) $a \ge 12$ (B) $a > 12$ (C) $a < 12$ (D) $a \le 12$

14. If S_1 is the sum of an arithmetic series of 'n' odd number of terms and S_2, the sum of the terms of the series in odd places, then $\frac{S_1}{S_2} =$

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

15. A club consists of members whose ages are in A.P., the common difference being 3 months. If the youngest member of the club is just 7 years old and the sum of the ages of all the members is 250 years, then the number of members in the club are

(A) 15 (B) 25 (C) 20 (D) 30

16. If a is the first term, d the common difference and S_k the sum of k terms of an A.P., then for $\frac{S_{kx}}{S_x}$ to be independent of x.

(A) $a = 2d$ (B) $a = d$ (D) $2a = d$ (D) none of these

17. Between two numbers whose sum is $2\frac{1}{6}$, an even number of arithmetic means are inserted. If the sum of these means exceeds their number by unity, then the number of means are

(A) 12 (B) 10 (C) 8 (D) none of these

18. If a, b, c are in A.P. and p is the A.M. between a and b and q is the A.M. between b and c, then

(A) a is the A.M. between p and q (B) b is the A.M. between p and q

(C) c is the A.M. between p and q (D) none of these

19. The sum of n terms of m A.P.s are $S_1, S_2, S_3 + ... + S_m =$

(A) $\frac{1}{4}mn(m+1)(n+1)$ (B) $\frac{1}{2}mn(m+1)(n+1)$ (C) $mn(m+1)(n+1)$ (D) none of these

20. If a, b, c are respectively the xth yth and zth terms of a G.P., then

$(y-z)\log a + (z-x)\log b + (x-y)\log c =$

(A) 1 (B) – 1 (C) 0 (D) none of these

INTEGER TYPE

21. If $\frac{1}{1^4}+\frac{1}{2^4}+\frac{1}{3^4}+...\text{to } \infty = \frac{\pi^4}{90}$ and $\frac{1}{1^4}+\frac{1}{3^4}+\frac{1}{5^4}+...\text{to } \infty = \frac{\pi^4}{k}$. Then find the value of k.

22. Let S_n denote sum of first n terms of A.P. If $S_{2n} = 3S_n$ then find the value of $\frac{S_{3n}}{S_n}$.

23. If $\sum_{r=1}^{n} r^4 = f(n)$ and $\sum_{r=1}^{n} (2r-1)^4 = f(2n) - k\,f(n)$. Then find the value of k.

24. If a, b, c and d are in HP then find the value of $\frac{ab+bc+cd}{ad}$.

25. If the value of $1^2+2^2-3^2-4^2+5^2+6^2-7^2-8^2+...2019^2-2020^2 = -2019k$. Then find the value of k.

KEY

1.	C	**2.**	A	**3.**	C	**4.**	C	**5.**	B
6.	C	**7.**	A	**8.**	A	**9.**	D	**10.**	D
11.	C	**12.**	C	**13.**	A	**14.**	A	**15.**	B
16.	C	**17.**	A	**18.**	B	**19.**	A	**20.**	C
21.	96	**22.**	6	**23.**	16	**24.**	3	**25.**	2020

❇ *Wish You all the Best* ❇