DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth **SUBJECT : MATHS**
DATE : **DPP NO. :6**

Topic :-SEQUENCES AND SERIES

1. If x, y, z are in HP, then the value of expression $\log(x+z)+\log(x-2y+z)$ will be
   a) $\log(x-z)$ b) $2\log(x-z)$ c) $3\log(x-z)$ d) $4\log(x-z)$

2. If $< a_n >$ is an arithmetic sequence, then $\Delta = \begin{vmatrix} a_m & a_n & a_p \\ m & n & p \\ 1 & 1 & 1 \end{vmatrix}$ equals
   a) 1 b) -1 c) 0 d) None of these

3. $\frac{1}{1!(n-1)!}+\frac{1}{3!(n-3)!}+\frac{1}{5!(n-5)!}+\ldots$ is equal to
   a) $\frac{2^{n-4}}{n!}$ for even values of n only b) $\frac{2^{n-4}+1}{n!}-1$ for odd values of n only
   c) $\frac{2^{n-1}}{n!}$ for all values of n d) None of the above

4. The number of solutions of the equation $\log_4(x-1)=\log_2(x-3)$, is
   a) 3 b) 1 c) 2 d) 0

5. The sum of the series $(1+2)(1+2+2^2)+(1+2+2^2+2^3)+\ldots$ up to n terms is
   a) $2^{n+2}-n-4$ b) $2(2^n-1)-n$ c) $2^{n+1}-n$ d) $2^{n+1}-1$

6. The value of
$1+\frac{(\log_e n)^2}{2!}+\frac{(\log_e n)^4}{4!}+\ldots$ is
   a) n b) $\frac{1}{n}$ c) $\frac{n+n^{-1}}{2}$ d) $\frac{e^n+e^{-n}}{2}$

7. $\log_e 3-\frac{\log_e 9}{2^2}+\frac{\log_e 27}{3^2}-\frac{\log_e 81}{4^2}+\ldots$ is
   a) $(\log_e 3)(\log_e 2)$ b) $\log_e 3$ c) $\log_e 2$ d) $\frac{\log_e 5}{\log_e 3}$

8. If three positive real numbers a,b,c $(c>a)$ are in H.P., then $\log(a+c)+\log(a-2b+c)$ is equal to
   a) $2\log(c-b)$ b) $2\log(a+c)$ c) $2\log(c-a)$ d) $\log a+\log b+\log c$

9. Let T_r be the rth term of an AP for $r = 1, 2, 3,\ldots$ If for some positive integers m, n, we have $T_m = \frac{1}{n}$ and $T_n = \frac{1}{m}$, then T_{mn} equals

a) $1/mn$ b) $1/m + 1/n$ c) 1 d) 0

10. If the first, second and last terms of an arithmetic series are a,b and c respectively, then the number of terms is

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

11. Let $S_1, S_2,\ldots$ be squares such that for each $n \geq 1$, the length of a side of S_n equals the length of a diagonal of S_{n+1}. If the length of a side of S_1 is 10cm, then for which of the following values of n is the area of S_n less than 1 sq cm?

a) 7 b) 6 c) 9 d) None of the above

12. If $x = 1 + a + a^2 + \ldots\infty$ and $y = 1 + b + b^2 + \ldots\infty$ where a and b are proper fractions, then $1 + ab + a^2b^2 + \ldots\infty$ equals

a) $\frac{xy}{y+x-1}$ b) $\frac{x+y}{x-y}$ c) $\frac{x^2+y^2}{x-y}$ d) None of these

13. If a_1,$a_2,\ldots a_n$ are in AP with common difference $d \neq 0$, then $(\sin d)[\sec a_1 \sec a_2 + \sec a_2 \sec a_3 + \ldots + \sec a_{n-1} \sec a_n]$ is equal to

a) $\cot a_n - \cot a_1$ b) $\cot a_1 - \cot a_n$ c) $\tan a_n - \tan a_1$ d) $\tan a_n - \tan a_{n-1}$

14. The H.M. of two numbers is 4 and the arithmetic mean A and geometric mean G satisfy the relation $2A + G^2 = 27$, the numbers are

a) 6, 3 b) 5, 4 c) 5, -2.5 d) $-3, 1$

15. If a_1,$a_2,\ldots,a_n$ are in HP, then the expression $a_1a_2 + a_2a_3 + \ldots + a_{n-1}a_n$ is equal to

a) $(n-1)(a_1 - a_n)$ b) na_1a_n c) $(n-1)a_1a_n$ d) $n(a_1 - a_n)$

16. If the first term of an A.P. is 2 and common difference is 4, then the sum of its 40 terms is

a) 3200 b) 1600 c) 200 d) 2800

17. If $2^{\log_{10} 3\sqrt{3}} = 3^{k \log_{10}^2}$, then $k =$

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

18. Let α,β,γ and δ are four positive real numbers such that their product is unity, then the least value of $(1+\alpha)(1+\beta)(1+\gamma)(1+\delta)$ is

a) 6 b) 16 c) 0 d) 32

19. The sum of the series $6 + 66 + 666 + \ldots$ upto n term is

a) $\frac{10^{n-1} - 9n + 10}{81}$ b) $\frac{2(10^{n+1} - 9n - 10)}{27}$ c) $\frac{2(10^n - 9n - 10)}{27}$ d) None of these

20. The sum to n terms of the series $\frac{4}{3}+\frac{10}{9}+\frac{28}{27}+\ldots$ is

a) $\frac{3^n(2n+1)+1}{2(3^n)}$ b) $\frac{3^n(2n+1)-1}{2(3^n)}$ c) $\frac{3^n\,n-1}{2(3^n)}$ d) $\frac{3^n-1}{2}$