DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth **SUBJECT : MATHS**
DATE : **DPP NO. :10**

Topic :-SEQUENCES AND SERIES

1. If sum of an infinite geometric series is $\frac{4}{3}$ and its 1st term is $\frac{3}{4}$, then its common ration is
   a) $\frac{7}{16}$ b) $\frac{9}{16}$ c) $\frac{1}{9}$ d) $\frac{7}{9}$

2. If $\log_{10}\{98+\sqrt{x^2-12x+36}\}=2$, then $x=$
   a) 4 b) 8 c) 12 d) 4, 8

3. If $a=\sum_{n=1}^{\infty}\frac{2n}{(2n-1)!}, b=\sum_{n=1}^{\infty}\frac{2n}{(2n+1)!}$, then ab equals
   a) 1 b) e^2 c) $\frac{e-1}{e+1}$ d) $\frac{e+1}{e-1}$

4. The sum to n terms of the series $1+\frac{3}{2}+\frac{7}{4}+\frac{15}{8}+\frac{31}{16}+\ldots$, is
   a) $2(n-1)+\frac{1}{2n-1}$ b) $2n-\frac{1}{2^n}$ c) $2+\frac{1}{2^n}$ d) $2n-1+\frac{1}{2^n}$

5. If $0<\phi<\frac{\pi}{2}$, $x=\sum_{n=0}^{\infty}\cos^{2n}\phi$, $y=\sum_{n=0}^{\infty}\sin^{2n}\phi$ and $z=\sum_{n=0}^{\infty}\cos^{2n}\phi\sin^{2n}\phi$, then
   a) $xyz=xz+y$ b) $xyz=xy+z$ c) $xyz=x+y+z$ d) $xyz=yz+x$

6. In an arithmetic progression, the 24th term is 100. Then, the sum of the first 47 terms of the arithmetic progression is
   a) 2300 b) 2350 c) 2400 d) 4700

7. If a,b,c,d,e,f are A.M.'s between 2 and 12, then $a+b+c+d+e+f$ is equal to
   a) 14 b) 42 c) 84 d) None of these

8. If $x=\log_2 3$ and $y=\log_{1/2}5$, then
   a) $x>y$ b) $x<y$ c) $x=y$ d) None of these

9. The sum of n terms of the series $1+(1+x)+1(1+x+x^2)+\ldots$ will be
   a) $\frac{1-x^n}{1-x}$ b) $\frac{x(1-x^n)}{1-x}$ c) $\frac{n(1-x)-x(1-x^n)}{(1-x)^2}$ d) None of these

10. If $\log_2 7=x$, then x is:
    a) A rational number such that $0<x<2$

b) An irrational number such that $2 < x < 3$
c) A rational number such that $2 < x < 3$
d) A prime number of the form $7x + 2$

11. If $4^{\log_9 3} + 9^{\log_2 4} = 10^{\log_x 83}$, then $x =$
a) 4 b) 9 c) 83 d) 10

12. If $\log_a x, \log_b x, \log_c x$ be in HP, then a, b, c are in
a) AP b) HP c) GP d) None of these

13. Consider the following statement :
1.If mth term of HP is n and the $n$the term is m, then the (mn)th term is 1.
2.If a, b, c are in AP and $a, 2b, c$ are in GP, then $a, 4b, c$ are in HP.
3.If any odd number of quantities are in AP, then first middle and last are in AP
Which of the statement give above is/are correct?
a) Only (1) b) Only (2) c) Only (3) d) All of these

14. The first two terms of a geometric progression add upto 12. The sum of the third and the fourth terms is 48. If terms of the geometric progression are alternately positive and negative, then the first term is
a) 4 b) -4 c) -12 d) 12

15. $2\left\{\frac{m-n}{m+n} + \frac{1}{3}\left(\frac{m-n}{m+n}\right)^3 + \frac{1}{5}\left(\frac{m-n}{m+n}\right)^5 + \ldots\right\}$ is equal to
a) $\log\left(\frac{m}{n}\right)$ b) $\log\left(\frac{n}{m}\right)$ c) $\log mn$ d) None of these

16. For any integer $n \geq 1$, the sum $\sum_{k=1}^{n} k(k+2)$ is equal to
a) $\frac{n(n+1)(n+2)}{6}$ b) $\frac{n(n+1)(2n+1)}{6}$ c) $\frac{n(n+1)(2n+7)}{6}$ d) $\frac{n(n+1)(2n+9)}{6}$

17. If the sum of first p terms, first q terms and first r terms of an A.P. be x, y and z respectively. Then, $\frac{x}{p}(q-r) + \frac{y}{q}(r-p) + \frac{z}{r}(p-q)$ is
a) 0 b) 2 c) pqr d) $\frac{8\,xyz}{pqr}$

18. If $1, \log_9\left(3^{1-x}+2\right), \log_3(4.3^x - 1)$ are in A.P., then x equals
a) $\log_3 4$ b) $1 - \log_3 4$ c) $1 - \log_4 3$ d) $\log_4 3$

19. If the AM and GM of roots of a quadratic equations are 8 and 5 respectively, then the quadratic equation will be
a) $x^2 - 16x - 25 = 0$ b) $x^2 - 8x + 5 = 0$ c) $x^2 - 16x + 25 = 0$ d) $x^2 + 16x - 25 = 0$

20. The sum of the first n terms of the series $\frac{1}{\sqrt{2}+\sqrt{5}} + \frac{1}{\sqrt{5}+\sqrt{8}} + \frac{1}{\sqrt{8}+\sqrt{11}} + \ldots$ is
a) $\frac{1}{3}(\sqrt{3n+2} - \sqrt{2})$ b) $\sqrt{3n+2} - \sqrt{2}$

c) $\sqrt{3n+2}+\sqrt{2}$

d) $\frac{1}{3}(\sqrt{2}-\sqrt{3n+2})$