DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth | **SUBJECT : MATHS**
DATE : | **DPP NO. :5**

Topic :-SEQUENCES AND SERIES

1. If $\log_x a, a^{x/2}$ and $\log_b x$ are in G.P., then x is equal to
   a) $\log_a(\log_b a)$
   b) $\log_a(\log_e a) + \log_a(\log_e b)$
   c) $-\log_a(\log_a b)$
   d) $\log_a(\log_e b) - \log_a(\log_e a)$

2. The sum of $i - 2 - 3i + 4$.... upto 100 terms, where $i = \sqrt{-1}$ is
   a) $50(1-i)$ b) $25\, i$ c) $25\,(1+i)$ d) $100\,(1-i)$

3. If $\log_2 x + \log_4 x + \log_{16} x = \frac{21}{4}$, then x equals to
   a) 8 b) 4 c) 2 d) 16

4. The sum of all two digit numbers which, when divided by 4, yield unity as a remainder is
   a) 1190 b) 1197 c) 1210 d) None of these

5. $\frac{1}{2.5} + \frac{1}{5.8} + \frac{1}{8.11} + ...$upto $n$terms is equal to
   a) $\frac{n}{4n+6}$ b) $\frac{1}{6n+4}$ c) $\frac{n}{6n+4}$ d) $\frac{n}{3n+7}$

6. Let $a, b, c > 0$ and $4a^2 + 9b^2 + 16c^2 - 6ab - 12bc - 8ac = 0$, then b is
   a) $\leq \sqrt{ac}$ b) $\geq \sqrt{ab}$ c) $\geq \frac{a+c}{2}$ d) $\geq \sqrt{ac}$

7. If 9 AM's and HM's are inserted between the 2 and 3 and if the harmonic mean H is corresponding to arithmetic mean A, then $A + \frac{6}{H}$ is equal to
   a) 1 b) 3 c) 5 d) 6

8. If a,b,c are in G.P., then $\log_a x, \log_b x, \log_c x$ are in
   a) A.P. b) G.P. c) H.P. d) None of these

9. If $a_1, a_2, a_3..., a_{20}$ are AM's between 13 and 67, then the maximum value of $a_1, a_2, a_3..., a_{20}$ is equal to
   a) $(20)^{20}$ b) $(40)^{20}$ c) $(60)^{20}$ d) $(80)^{20}$

10. The coefficient of n^{-r} in the expansion of $\log_{10}\left(\frac{n}{n-1}\right)$, is

a) $\frac{1}{r\log_e 10}$ b) $-\frac{1}{r\log_e 10}$ c) $-\frac{1}{r!\log_e 10}$ d) $\frac{\log_e\left(1-\frac{1}{n}\right)}{\log_e^0}$

11. The following consecutive terms $\frac{1}{1+\sqrt{x}},\frac{1}{1-x},\frac{1}{1-\sqrt{x}}$ of a series are in

a) H.P. b) G.P. c) A.P. d) A.P., G.P.

12. The value of $\left[(0.16)^{\log_{0.25}\left(\frac{1}{3}+\frac{1}{3^2}+\frac{1}{3^3}+\ldots\infty\right)}\right]^{1/2}$ is

a) 1 b) -1 c) 0 d) None of these

13. A person is to count 45000 currency notes. Let a_n denotes the number of notes he counts in the nth minute. If $a_1 = a_2 = \ldots = 10_{10} = 150$ and $a_{10}, a_{11}, \ldots$ are in AP with common difference -2, then the time taken by him to count all notes, is

a) 24 min b) 34 min c) 125 min d) 135 min

14. The minimum number of terms from the beginning of the series $20 + 22\frac{2}{3} + 25\frac{1}{3} + \ldots$ so that the sum may exceed 1568, is

a) 25 b) 27 c) 28 d) 29

15. If pth, qth, rth and sth terms of an A.P. are in G.P., then $p-q, q-r, r-s$ are in

a) A.P. b) G.P. c) H.P. d) None of these

16. If p,q,r are in GP and $\tan^{-1}p, \tan^{-1}q, \tan^{-1}r$ are in AP, then p,q,r satisfies the relation

a) $p = q = r$ b) $p \neq q \neq r$ c) $p + q = r$ d) None of these

17. If S_n denotes the sum of n terms of an A.P. with common difference d, then

a) $d = S_n - S_{n-1} + S_{n-2}$

b) $d = S_n - 2S_{n-1} - S_{n-2}$

c) $d = S_n - 2S_{n-1} + S_{n-2}$

d) None of these

18. If $H_1, H_2, \ldots, H_n$ be n harmonic means between a and b, then $\frac{H_1+a}{H_1-a}+\frac{H_n+b}{H_n-n}$ is equal to

a) 0 b) n c) $2n$ d) 1

19. If S_n denotes the sum of the products of the first n numbers taken two at a time, then $\sum_{n=0}^{\infty}\frac{S_n}{(n+1)!}$ equals

a) $\frac{11e}{24}$ b) $\frac{11e}{12}$ c) $\frac{13e}{24}$ d) None of these

20. Let $\sum_{r=1}^{n} r^4 = f(n)$, then $\sum_{r=1}^{n}(2r-1)^4$ is equal to

a) $f(2n) - 16f(n)$ b) $f(2n) - 7f(n)$ c) $f(2n-1) - 8f(n)$ d) None of these