DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth **SUBJECT : MATHS**
DATE : **DPP NO. :3**

Topic :-SEQUENCES AND SERIES

1. Let $a, p, q, r, s \in R \sim \{0\}$.
If $3a^2 + 2\left(\frac{1}{p} - \frac{1}{s}\right)a + \frac{1}{p^2} + \frac{1}{q^2} + \frac{1}{r^2} - 2\left(\frac{1}{pq} + \frac{1}{qr} + \frac{1}{rs}\right) \leq 0$ for some real a, then p, q, r, s are in
a) AP b) GP c) HP d) AGP

2. The sum of series $\frac{1}{1.2} - \frac{1}{2.3} + \frac{1}{3.4} - \cdots \infty$ is equal to
a) $2\log_e 2$ b) $\log_e 2 - 1$ c) $\log_e 2$ d) $\log_e\left(\frac{4}{e}\right)$

3. If $x^{\log_x(x^2-4x+5)} = (x-1)$, then $x =$
a) 1 b) 2 c) 4 d) 5

4. If $2(y-a)$ is the H.M. between $y-x$ and $y-z$, then $x-a, y-a, z-a$ are in
a) A.P. b) G.P. c) H.P. d) none of these

5. The sum of the first n terms of the series $1^2 + 2.2^2 + 3^2 + 2.4^2 + 5^2 + 2.6^2 + \ldots$is $\frac{n(n+1)^2}{2}$ where n is even. When n is odd the sum is
a) $\frac{3n(n+1)}{2}$ b) $\frac{n^2(n+1)}{2}$ c) $\frac{n(n+1)^2}{4}$ d) $\left[\frac{n(n+1)}{2}\right]^2$

6. If $1 + \lambda + \lambda^2 + \ldots + \lambda^n = (1+\lambda)(1+\lambda^2)(1+\lambda^4)(1+\lambda^8)(1+\lambda^{16})$, then the value of n is (where $n \in N$)
a) 32 b) 16 c) 31 d) 15

7. The solution of the equation
$(x+1) + (x+4) + (x+7) + \ldots + (x+28) = 155$is
a) 1 b) 2 c) 3 d) 4

8. Let a_n be nth term of the GP of positive numbers. Let $\sum_{n=1}^{100} a_{2n} = \alpha$and $\sum_{n=1}^{100} a_{2n} = \beta$, such that $\alpha \neq \beta$, then the common ratio is
a) $\frac{\alpha}{\beta}$ b) $\frac{\beta}{\alpha}$ c) $\sqrt{\frac{\alpha}{\beta}}$ d) $\sqrt{\frac{\beta}{\alpha}}$

9. 99th term of the series $2 + 7 + 14 + 23 + 34 \ldots$ is
a) 9998 b) 9999 c) 10000 d) 100000

10. If a, b, c, d and p are distinct real number such that $(a^2 + b^2 + c^2)p^2 - 2(ab + bc + cd)p + (b^2 + c^2 + d^2) \leq 0$, then a, b, c, d
a) are in AP b) are in GP c) are in HP d) satisfy $ab = cd$

11. If $2p + 3q + 4r = 15$, then the maximum value of $p^3q^5r^7$ is

a) 2180 b) $\frac{5^4 \cdot 3^5}{2^{15}}$ c) $\frac{5^5 \cdot 7^7}{2^{17} \cdot 9}$ d) 2285

12. The number 111…1 (91 times) is a/an
a) Even number b) Prime number c) Not prime d) None of these

13. If $|x| < 1$, then the sum of the series $1 + 2x + 3x^2 + 4x^3 + \ldots \infty$ will be
a) $\frac{1}{1-x}$ b) $\frac{1}{1+x}$ c) $\frac{1}{(1+x^2)}$ d) $\frac{1}{(1-x)^2}$

14. The value of $5^{\sqrt{\log_5 7}} 7^{\sqrt{\log_7 5}}$ is
a) $\log 2$ b) 1 c) 0 d) None of these

15. If $x_1, x_2, x_3, \ldots x_n$ are in HP
Then, $x_1x_2 + x_2x_3 + \ldots + x_{n-1}x_n$ is equal to
a) $(n+1)x_1x_n$ b) $(n-1)x_1x_n$ c) $n\, x_1x_n$ d) $(n^2-1)x_1x_n$

16. Let a, b, c are in GP and $4a, 5b, 4c$ are in AP such that $a + b + c = 70$, then value of b is
a) 5 b) 10 c) 15 d) 20

17. If three unequal numbers p, q, r are in HP and their squares are in AP, then the ratio $p : q : r$ is
a) $1-\sqrt{3} : 2 : 1+\sqrt{3}$ b) $1 : \sqrt{2} : -\sqrt{3}$ c) $1 : -\sqrt{2} : \sqrt{3}$ d) $1 \mp \sqrt{3} : -2 : 1 \pm \sqrt{3}$

18. If $x = 1 + 2 + \frac{4}{2!} + \frac{8}{3!} + \frac{16}{4!} + \cdots$, then x^{-1} is equal to
a) e^{-2} b) e^2 c) $e^{1/2}$ d) None of these

19. It is given that $\frac{1}{1^4} + \frac{1}{2^4} + \frac{1}{3^4} + \ldots + \text{to } \infty = \frac{\pi^4}{90}$. Then, $\frac{1}{1^4} + \frac{1}{3^4} + \frac{1}{5^4} + \ldots \infty$ is equal to
a) $\frac{\pi^4}{96}$ b) $\frac{\pi^4}{45}$ c) $\frac{89}{90}\pi$ d) None of these

20. If $|x| < 1$ and $|y| < 1$, the sum to infinity of the sequence $x + y, (x^2 + xy + y^2), (x^3 + x^2y + y^3), \ldots$, is
a) $\frac{x+y-xy}{1-x-y+xy}$ b) $\frac{x+y+xy}{1-x-y+xy}$ c) $\frac{x}{1-x} + \frac{y}{1-y}$ d) $\frac{(x-y)(x+y-xy)}{1-x-y+xy}$