DPP

DAILY PRACTICE PROBLEMS

CLASS : XIth **SUBJECT : MATHS**

DATE : **DPP NO. :2**

Topic :-PRINCIPLE OF MATHEMATICAL INDUCTION

1. The nth term of the series $4 + 14 + 30 + 52 + 80 + 114 + \cdots$ is
   a) $5n - 1$ b) $2n^2 + 2n$ c) $3n^2 + n$ d) $2n^2 + 2$

2. If $P(n)$is a statement $(n \in N)$ such that, if $P(k)$ is true, $P(k+1)$ is true for $k \in N$, then $p(n)$ is true
   a) For all n b) For all $n > 1$ c) For all $n > 2$ d) Nothing can be said

3. Using mathematical induction, then numbers $a_n's$ are defined by a_0=1, $a_{n+1} = 3n^2 + n + a_n, (n \geq 0)$Then, a_n is equal to
   a) $n^3 + n^2 + 1$ b) $n^3 - n^2 + 1$ c) $n^3 - n^2$ d) $n^3 + n^2$

4. $\frac{(n+2)!}{(n-1)!}$ is divisible by
   a) 6 b) 11 c) 24 d) 26

5. If $P(n) = 2 + 4 + 6 + \ldots + 2n, n \in N$, then $P(k) = k(k+1) + 2 \Rightarrow P(k+1) = (k+1)(k+2) + 2$ for all $k \in N$. So, we can conclude that $P(n) = n(n+1) + 2$ for
   a) All $n \in N$ b) $n > 1$ c) $n > 2$ d) Nothing can be said

6. For all $\in N$, $2 \cdot 4^{2n+1} + 3^{3n+1}$ is divisible by
   a) 2 b) 9 c) 3 d) 11

7. For all $n \in N, n^4$ is less than
   a) 10^n b) 4^n c) 5^n d) 10^{10}

8. The number $a^n - b^n (a, b$ are distinct rational numbers and $n \in N)$ is always divisible by
   a) $a - b$ b) $a + b$ c) $2a - b$ d) $a - 2b$

9. If $n \in N$, then $3^{2n} + 7$ is divisible by
   a) 3 b) 8 c) 9 d) 11

10. For each, $n \in N$, $10^{2n-1} + 1$ is divisible by
    a) 11 b) 13 c) 9 d) None of these

11. If $10^n + 3.4^{n+2} + \lambda$ is exactly divisible by 9 for all $n \in N$, then the least positive integral value of λ is
    a) 5 b) 3 c) 7 d) 1

12. For all $n \in N$, $\cos\theta \cos 2\theta \cos 4\theta \ldots \cos 2^{n-1}\theta$ equals to
    a) $\frac{\sin 2^n\theta}{2^n \sin\theta}$ b) $\frac{\sin 2^n\theta}{\sin\theta}$ c) $\frac{\cos 2^n\theta}{2^n \cos 2\theta}$ d) $\frac{\cos 2^n\theta}{2^n \sin\theta}$

13. The inequality $n! > 2^{n-1}$ is true for

a) $n > 2$ b) $n \in N$ c) $n > 3$ d) None of these

14. If $P(n): 2 + 4 + 6 \ldots + (2n), n \in N$, then
$P(k) = k(k + 1) + 2$implies
$P(k) = (k + 1)(k + 2) + 2$
is true for all $k \in N$. So, statement $P(n) = n(n + 1) + 2$ is true for

a) $n \geq 1$ b) $n \geq 2$ c) $n \geq 3$ d) None of these

15. If $P(n): 3^n < n!, n \in N$, then $P(n)$ is true

a) For $n \geq 6$ b) For $n \geq 7$ c) For$n \geq 3$ d) For all n

16. Let $P(n)$ denotes the statement that $n^2 + n$ is odd. It is seen that $P(n) \Rightarrow P(n + 1), P(n)$ is true for all

a) $n > 1$ b) n c) $n > 2$ d) None of these

17. The sum to n terms of the series $1^3 + 3^3 + 5^3 + \cdots$ is

a) $n^2(n^2 - 1)$ b) $n^2(2n^2 - 1)$ c) $n^2(2n^2 + 1)$ d) $n^2(n^2 + 1)$

18. If $\in N$, then $11^{n+2} + 12^{2n+1}$ is divisible by

a) 113 b) 123 c) 133 d) None of these

19. For natural number $n, 2^n(n - 1)! < n^n$, if

a) $n < 2$ b) $n > 2$ c) $n \geq 2$ d) never

20. If $n \in N$, then $n(n^2 - 1)$ is divisible by

a) 6 b) 16 c) 36 d) 24