DPP
DAILY PRACTICE PROBLEMS

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

Topic :-PRINCIPLE OF MATHEMATICAL INDUCTION

1. $(2^{3n}-1)$will be divisible by $(\forall n \in N)$
   a) 25 b) 8 c) 7 d) 3

2. If $n \in N$, then $x^{2n-1}y^{2n-1}$ is divisible by
   a) $x+y$ b) $x-y$ c) x^2+y^2 d) None of these

3. If $x^{2n-1}+y^{2n-1}$ is divisible by $x+y$, if n is
   a) A positive integer b) An even positive integer
   c) An odd positive integer d) None of the above

4. If m, n are any two odd positive integer with $n < m$, then the largest positive integers which divides all the numbers of the type m^2-n^2 is
   a) 4 b) 6 c) 8 d) 9

5. If x^n-1 is divisible by $x-k$, then the least positive integral value of k is
   a) 1 b) 2 c) 3 d) 4

6. If n is a positive integer, then $5^{2n+2}-24n-25$ isdivisible by
   a) 574 b) 575 c) 675 d) 576

7. For all $n \in N$, $3^{3n}-26^n-1$ is divisible by
   a) 24 b) 64 c) 17 d) 676

8. Matrix A is such that $A^2 = 2A - I$ where I is the identity matrix, then for $n \geq 2$, A^n is equal to
   a) $n\,A-(n-1)I$ b) $n\,A-I$ c) $2^{n-1}A-(n-1)I$ d) $2^{n-1}A-I$

9. If $a_1 = 1$ and $a_n = na_{n-1}$ for all positive integer $n \geq 2$, then a_5 is equal to
   a) 125 b) 120 c) 100 d) 24

10. For all $n \in N$, $1+\frac{1}{\sqrt{2}}+\frac{1}{\sqrt{3}}+\cdots+\frac{1}{\sqrt{n}}$ is
    a) Equal to $\sqrt{n}$
    b) Less than or equal to $\sqrt{n}$
    c) Greater than or equal to $\sqrt{n}$
    d) None of these

11. Let $P(n): n^2+n+1$ is an even integer. If $P(k)$ is assumed true $\Rightarrow P(k+1)$ is true. Therefore, $P(n)$ is true
    a) For $n > 1$ b) For all $n \in N$ c) For $n > 2$ d) None of these

12. $2^{3n} - 7n - 1$ is divisible by
a) 64 b) 36 c) 49 d) 25

13. For all $n \in N, 3n^5 + 5n^3 + 7n$ is divisible by
a) 3 b) 5 c) 10 d) 15

14. If n is a positive integer, then $n^3 + 2n$ is divisible by
a) 2 b) 6 c) 15 d) 3

15. For all $n \in N, 49^n + 16n - 1$ is divisible by
a) 64 b) 8 c) 16 d) 4

16. If $P(n)$ is a statement such that $P(3)$ is true. Assuming $P(k)$ is true $\Rightarrow P(k+1)$ is true for all $k \geq 3$, then $P(n)$ is true
a) For all n b) For $n \geq 3$ c) For $n > 4$ d) None of these

17. If n is an odd positive integer, then $a^n + b^n$ is divisible by
a) $a + b$ b) $a - b$ c) $a^2 + b^2$ d) None of these

18. The nth terms of the series $3 + 7 + 13 + 21 + \cdots$ is
a) $4n - 1$ b) $n^2 + 2n$ c) $n^2 + n + 1$ d) $n^2 + 2$

19. If a, b are distinct rational numbers, then for all $n \in N$ the number $a^n - b^n$ is divisible by
a) $a - b$ b) $a + b$ c) $2a - b$ d) $a - 2b$

20. $x(x^{n-1} - n\alpha^{n-1}) + \alpha^n(n-1)$ is divisible by $(x - \alpha)^2$ for
a) $n > 1$ b) $n > 2$ c) All $n \in N$ d) None of these