Topic :-Binomial Theorem

1. $1 + \frac{2 \cdot 1}{3 \cdot 2} + \frac{2 \cdot 5}{3 \cdot 6}\left(\frac{1}{2}\right)^2 + \frac{2 \cdot 5 \cdot 8}{3 \cdot 6 \cdot 9} \cdot \left(\frac{1}{2}\right)^3 + ...$ is equal to
   a) $2^{1/3}$ b) $3^{1/4}$ c) $4^{1/3}$ d) $3^{1/3}$

2. If in the expansion of $\left(3x - \frac{2}{x^2}\right)^{15}$ rth term is independent of x, then value of r is
   a) 6   b) 10   c) 9   d) 12

3. If $(1 + x)^n = C_0 + C_1 x + C_2 x^2 + ... + C_n x^n$, then the value of $\sum_{0 \leq r < s \leq n} \sum (r + s)(C_r + C_s)$ is
   a) $n^2.2^n$ b) $n.2^n$ c) $n^2.2^{2n}$ d) None of these

4. If $C_0, C_1, C_2, ..., C_n$ denote the binomial coefficient in the expansion of $(1 + x)^n$, then the value of a $C_0 + (a + b)C_1 + (a + 2b)C_2 + ... + (a + nb)C_n$, is
   a) $(a + nb)^{2n}$ b) $(a + nb)2^{n-1}$ c) $(2a + nb)2^{n-1}$ d) $(2a + nb)2^n$

5. $C_0 C_r + C_1 C_{r+1} + C_2 C_{r+2} + ... + C_{n-r} C_n$ is equal to
   a) $\dfrac{(2n)!}{(n - r)!(n + r)!}$

   b) $\dfrac{n!}{r!(n + r)!}$

   c) $\dfrac{n!}{(n - r)!}$

   d) None of these

6. If the coefficients of x^2 and x^3 in the expansion of $(3 + ax)^9$ are the same, then the value of a, is
   a) $-\frac{7}{9}$ b) $-\frac{9}{7}$ c) $\frac{7}{9}$ d) $\frac{9}{7}$

7. The total number of terms in the expansion of $(x + a)^{100} + (x - a)^{100}$ after simplification will be
   a) 202   b) 51   c) 50   d) None of these

8. Coefficient of x^{19} in the polynomial $(x - 1)(x - 2).....(x - 20)$ is equal to
   a) 210   b) -210 c) 20!   d) None of these

9. The sum of the last eight coefficient in the expansion of $(1 + x)^{15}$ is

   a) 2^{16} b) 2^{15} c) 2^{14} d) None of these

10. The number of terms in the expansion of $(a + b + c)^n$ will be
    a) $n + 1$
    b) $n + 3$
    c) $\dfrac{(n + 1)(n + 2)}{2}$
    d) None of these

11. The coefficient of y in the expansion of $(y^2 + c/y)^5$, is
    a) $29\ c$ b) $10\ c$ c) $10\ c^3$ d) $20\ c^2$

12. The value of $(0.99)^{15}$ is

    a) 0.8432   b) 0.8601   c) 0.8502   d) None of these

13. The sum of the coefficients in the expansion of $(x + y)^n$ is 4096. The greatest coefficient in the expansion is
    a) 1024   b) 924   c) 824   d) 724

14. If in the expansion of $(1 + x)^n$, the coefficient of rth and $(r + 2)$th term be equal, then r is equal to

    a) $2n$ b) $\dfrac{2n + 1}{2}$ c) $\dfrac{n}{2}$ d) $\dfrac{2n - 1}{2}$

15. If the second, third and fourth term in the expansion of $(x + a)^n$ are 240,720 and 1080

    respectively, then the value of n is

    a) 15   b) 20   c) 10   d) 5

16. The value of $\dfrac{1}{81^n} - \dfrac{10}{81^n}\,^{2n}C_1\dfrac{10^2}{81^n}\,^{2n}C_2 - \dfrac{10^3}{81^n}2\,^{2n}C_3 + ... + \dfrac{10^{2n}}{81^n}$ is

    a) 2   b) 0   c) $\dfrac{1}{2}$ d) 1

17. If $(1 + x + x^2)^n = \sum_{r=0}^{2n} a_r x^r$

    then, $a_1 - 2a_2 + 3a_3 ... - 2na_{2n}$ is equal to

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

18. The coefficient of the middle term in the expansion of $(1 + x)^{2n}$, is

a) $\dfrac{1 \cdot 3 \cdot 5 \ldots (2n-1)}{n!} 2^n$ b) $\dfrac{1 \cdot 3 \cdot 5 \ldots (2n-1)}{(n!)^2} 2^n$ c) $\dfrac{(2n)!}{(n!)^2} 2^{2n}$ d) None of these

19. The constant term in the expansion of $(1+x)^{10}\left(1+\dfrac{1}{x}\right)^{12}$ is

a) $^{22}C_{10}$ b) 0   c) $^{22}C_{11}$ d) None of these

20. 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