DPP
DAILY PRACTICE PROBLEMS

Class : XIth **Subject :Maths**
Date : **DPP No. :8**

Topic :-Binomial Theorem

1. If the expansion in power of x of the function
$\frac{1}{(1-ax)(1-bx)}$ is $a_0 + a_1x + a_2x^2 + a_3x^3 + ...$, then a_n is
a) $\frac{a_n - b^n}{b-a}$ b) $\frac{a^{n+1} - b^{n+1}}{b-a}$ c) $\frac{b^{n+1} - a^{n+1}}{b-a}$ d) $\frac{b^n - a^n}{b-a}$

2. If $(1+2x+x^2)^5 = \sum_{k=0}^{15} a_k x^k$, then $\sum_{k=0}^{7} = a_{2k}$ is equal to
a) 128 b) 156 c) 512 d) 1024

3. If n is even, then the middle term in the expansion of $\left(x^2 + \frac{1}{x}\right)^n$ is $924x^6$, then n is equal to
a) 10 b) 12 c) 14 d) None of these

4. The coefficient of x^5 in the expansion of $(1+x^2)^5(1+x)^4$ is
a) 30
b) 60
c) 40
d) None of these

5. The coefficient of x^4 in the expansion of $(1+x+x^2+x^3)^n$ is
a) ${}^nC_4$
b) ${}^nC_4 + {}^nC_2$
c) ${}^nC_4 + {}^nC_2 + {}^nC_2$
d) ${}^nC_4 + {}^nC_2 + {}^nC_1 \cdot {}^nC_2$

6. If a, b, c, d be four consecutive coefficients in the binomial expansion of $(1+x)^n$, then the value of the expression $\left\{\left(\frac{b}{b+c}\right)^2 - \frac{ac}{(a+b)(c+d)}\right\}$(where $x > 0$) is
a) < 0 b) > 0 c) $= 0$ d) 2

7. The coefficient of x^3 in $\left(\sqrt{x^5}+\frac{3}{\sqrt{x^3}}\right)^6$, is

a) 0 b) 120 c) 420 d) 540

8. The coefficient of x^{-7} in the expansion of $\left[ax-\frac{1}{bx^2}\right]^{11}$ will be

a) $\frac{462a^6}{b^5}$ b) $\frac{462a^5}{b^6}$ c) $-\frac{462a^5}{b^6}$ d) $-\frac{462a^6}{b^5}$

9. The coefficient of x^5 in the expansion of $(x+3)^6$ is

a) 18 b) 6 c) 12 d) 10

10. For $r=0, \ldots,10$ let A_r, B_r and C_r denotes, respectively, the coefficient of x^r in the $(1+x)^{10}$, $(1+x)^{20}$, and $(1+x)^{30}$. Then

$$\sum_{r=1}^{10} A_r(B_{10}B_r - C_{10}A_r)$$

is equal to

a) $B_{10}-C_{10}$ b) $A_{10}\left(B_{10}^2-C_{10}A_{10}\right)$

c) 0 d) $C_{10}-B_{10}$

11. If p and q be positive, then the coefficients of x^p and x^q in the expansion of $(1+x)^{p+q}$ will be

a) Equal

b) Equal in magnitude but opposite in sign

c) Reciprocal to each other

d) None of the above

12. If for positive integers $r>1$, $n>2$, the coefficient of the $(3r)$th and $(r+2)$th powers of x in the expansion of $(1+x)^{2n}$ are equal, then

a) $n=2r$ b) $n=3r$ c) $n=2r+1$ d) None of these

13. The range of values of the term independent of x in the expansion of $\left(x\sin^{-1}\alpha+\frac{\cos^{-1}\alpha}{x}\right)^{10}$, $\alpha \in [-1,1]$, is

a) $\left[-\frac{{}^{10}C_5\,\pi^{10}}{2^5}, \frac{{}^{10}C_5\,\pi^{10}}{2^{20}}\right]$ b) $\left[\frac{{}^{10}C_5\,\pi^2}{2^{20}}, \frac{{}^{10}C_5\,\pi^2}{2^5}\right]$ c) [1, 2] d) (1, 2)

14. If the coefficient of rth and $(r+1)$th terms in the expansion of $(3+7x)^{29}$ are equal, then r equals

a) 15 b) 21 c) 14 d) None of these

15. If the third term in the expansion $\left[x+x^{\log_{10} x}\right]^5$ is 10^6, then $x(>1)$ may be

a) 1 b) 10 c) $10^{-5/2}$ d) 10^2

16. In the expansion of $(1+x)^{50}$, the sum of the coefficient of add power of x is

a) Zero b) 2^{49} c) 2^{50} d) 2^{51}

17. If the coefficients of r^{th} and $(r+1)^{th}$ terms in the expansion of $(3+7x)^{29}$ are equal, then $r=$

a) 15 b) 21 c) 14 d) None of these

18. In the expansion of $(1+x)^{2n}(n \in N)$, the coefficients of $(p+1)^{th}$ and $(p+3)^{th}$ terms are equal, then

a) $p=n-2$ b) $p=n-1$ c) $p=n+1$ d) $p=2\,n-2$

19. Let $(1+x)^n=\sum_{r=0}^{n} a_r\, x^r$. Then,
$\left(1+\frac{a_1}{a_0}\right)\left(1+\frac{a_2}{a_1}\right)\ldots\left(1+\frac{a_n}{a_{n-1}}\right)$ *is equal to*

a) $\frac{(n+1)^{n+1}}{n\,!}$ b) $\frac{(n+1)^n}{n\,!}$ c) $\frac{n^{n-1}}{(n-1)\,!}$ d) $\frac{(n+1)^{n-1}}{(n-1)\,!}$

20. If $C_0, C_1, C_2, \ldots, C_n$ denote the binomial coefficients in the expansion of $(1+x)^n$, then the value of $\sum_{r=0}^{n}(r+1)C_r$, is

a) $n\,2^n$ b) $(n+1)2^{n-1}$ c) $(n+2)2^{n-1}$ d) $(n+2)2^{n-2}$