BINOMIAL THEOREM

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EXERCISE

Q1. If $(1+x)^{15} = C_0 + C_1x + C_2x^2 + \cdots + C_{15}x^{15}$, then $C_2 + 2C_3 + 3C_4 + \cdots + 14C_{15}$ Is equal to.

(a) 14.2^{14} (b) $13.2^{14} + 1$ (c) $13.2^{14} - 1$ (d) None of these

Q2. If the binomial expansion of $(a+bx)^{-2}$ is $\frac{1}{4} - 3x + \cdots$, then find (a, b)

(a) (2,12) (b) (2,8) (c) (-2,-12) (d) None of these

Q3. If a_1, a_2, a_3, a_4 are the coefficients of any four consecutive terms in the expansion of $(1+x)^n$, then $\frac{a_1}{a_1+a_2} + \frac{a_3}{a_8+a_4}$ is equal to.

(a) $\frac{a_2}{a_2+a_3}$ (b) $\frac{1}{2}\frac{a_2}{(a_2+a_m)}$ (c) $\frac{2a_2}{a_2+a_8}$ (d) $\frac{2a_3}{a_2+a_8}$

Q4. Let n be an odd integer. If $\sin n\theta = \sum_{r=0}^{n} b_r \sin^r \theta$ for every value of θ, then

(a) $b_0 = 1, b_1 = 3$ (b) $b_0 = 0, b_1 = n$

(c) $b_0 = -1, b_1 = n$ (d) $b_0 = 0, b_1 = n^2 - 3n + 3$

Q5. If n is odd, then $C_0^2 - C_1^2 + C_2^2 - C_3^2 + \cdots + (-1)^n C_n^2$ is equal to

(a) 0 (b) 1 (c) ∞ (d) $\frac{n!}{(\frac{n}{2})^2!}$

Q6. ${C_0}^{15} \cdot {C_5}^{.5} + {C_1}^{15}{C_4}^{.5} + {C_2}^{15}{C_3}^{.5} + {C_3}^{15}{C_2}^{5} + {C_4}^{15}{C_1}^{.5}$ is equal to

(a) $2^{20} - 2^5$ (b) $\frac{20!}{5!15!} - 1$ (c) $\frac{20!}{5!15!} - 1$ (d) $\frac{20!}{5!15!} - \frac{15!}{5!10!}$

Q7. $\frac{1}{1!(n-1)!} + \frac{1}{3!(n-3)!} + \frac{1}{5!(n-5)!} + \cdots$ is equal to

(a) $\frac{2^n}{n!}$ (b) $\frac{2^{n-1}}{n!}$ (c) 0 (d) None of these

Q8. If the value of x is sufficiently small that x^3 and higher powers of x can be neglected, then $\frac{(1+x)^{3/2}-(1+\frac{1}{2}x)^3}{(1-x)^{1/2}}$ can be approximated as.

(a) $\frac{x}{2}-\frac{3}{8}x^2$ (b) $-\frac{3}{8}x^2$ (c) $3x+\frac{3}{8}x^2$ (d) $1-\frac{3}{8}x^2$

Q9. 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

ANSWER KEY

1. (b)

2. (a)

3. (c)

4. (b)

5. (a)

6. (d)

7. (b)

8. (b)

9. (c)