

Topic : Binomial Theorem

Type of Questions

M.M., Min.

Single choice Objective (no negative marking) Q.1,3,4,5,6,9

(3 marks, 3 min.)

[18, 18]

Multiple choice objective (no negative marking) Q.7,8

(5 marks, 4 min.)

[10, 8]

Subjective Questions (no negative marking) Q.2,10

(4 marks, 5 min.)

[8, 10]

- Given that the term of the expansion $(x^{1/3} - x^{-1/2})^{15}$ which does not contain x is $5m$, where $m \in \mathbb{N}$, then $m =$
(A) 1100 (B) 1010 (C) 1001 (D) none
- Find the term in the expansion of $(2x - 5)^6$ which have
(i) Greatest binomial coefficient (ii) Greatest numerical coefficient
(iii) Algebraically greatest coefficient (iv) Algebraically least coefficient
- The value of $\frac{C_0}{1.3} - \frac{C_1}{2.3} + \frac{C_2}{3.3} - \frac{C_3}{4.3} + \dots + (-1)^n \frac{C_n}{(n+1).3}$ is :
(A) $\frac{3}{n+1}$ (B) $\frac{n+1}{3}$ (C) $\frac{1}{3(n+1)}$ (D) none of these
- The value of the expression ${}^{47}C_4 + \sum_{j=1}^5 {}^{52-j}C_3$ is equal to:
(A) ${}^{47}C_5$ (B) ${}^{52}C_5$ (C) ${}^{52}C_4$ (D) ${}^{49}C_4$
- The value of $\binom{50}{0}\binom{50}{1} + \binom{50}{1}\binom{50}{2} + \dots + \binom{50}{49}\binom{50}{50}$ is, where ${}^nC_r = \binom{n}{r}$
(A) $\binom{100}{50}$ (B) $\binom{100}{51}$ (C) $\binom{50}{25}$ (D) $\binom{50}{25}^2$
- If $|x| < 1$, then the co-efficient of x^n in the expansion of $(1 + x + x^2 + x^3 + \dots)^2$ is
(A) n (B) $n - 1$ (C) $n + 2$ (D) $n + 1$
- If the expansion of $(3x + 2)^{-1/2}$ is valid in ascending powers of x , then x lies in the interval.
(A) $(0, 2/3)$ (B) $(-3/2, 3/2)$ (C) $(-2/3, 2/3)$ (D) $(-\infty, -3/2) \cup (3/2, \infty)$
- The coefficient of x^4 in $\left(\frac{1+x}{1-x}\right)^2$, $|x| < 1$, is
(A) 4 (B) -4 (C) $10 + {}^4C_2$ (D) 16
- The co-efficient of x^4 in the expansion of $(1 - x + 2x^2)^{12}$ is:
(A) ${}^{12}C_3$ (B) ${}^{13}C_3$ (C) ${}^{14}C_4$ (D) ${}^{12}C_3 + 3 {}^{13}C_3 + {}^{14}C_4$
- If $(1 + x)^n = C_0 + C_1 x + C_2 x^2 + \dots + C_n x^n$, prove that
(i) $C_0 C_3 + C_1 C_4 + \dots + C_{n-3} C_n = \frac{(2n)!}{(n+3)!(n-3)!}$
(ii) $C_0 C_r + C_1 C_{r+1} + \dots + C_{n-r} C_n = \frac{(2n)!}{(n+r)!(n-r)!}$
(iii) $C_0^2 - C_1^2 + C_2^2 - C_3^2 + \dots + (-1)^n C_n^2 = 0$ or $(-1)^{n/2} C_{n/2}$ according as n is odd or even.

Answers Key

1. (C) 2. (i) T_4 (ii) T_5, T_6 (iii) T_5 (iv) T_6
3. (C) 4. (C) 5. (B) 6. (D)
7. (A)(C) 8. (C)(D) 9. (D)