



GOVERNMENT OF KARNATAKA
DEPARTMENT OF SCHOOL EDUCATION (PRE-UNIVERSITY)

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CHAPTERWISE MULTIPLE CHOICE QUESTIONS FOR COMPETATIVE EXAM

SUBJECT: MATHEMATICS – I PUC

NAME OF THE CHAPTER: BINOMIAL THEOREM



An algebraic expression consisting of two terms with + or – sign between them is called binomial expression.

Eg. $(a+b)$, $(x-2y)$.

Binomial theorem is the formula obtained by the binomial raised to the power n , where n can be a positive integer, negative integer or a fraction.

BINOMIAL THEOREM FOR POSITIVE INTEGRAL INDEX

If n is a positive integer and $x, a \in R$, then

$$(x + a)^n = {}^nC_0 x^n + {}^nC_1 x^{n-1} a + {}^nC_2 x^{n-2} a^2 + \dots + {}^nC_n a^n$$

$$(x - a)^n = {}^nC_0 x^n - {}^nC_1 x^{n-1} a + {}^nC_2 x^{n-2} a^2 - \dots + (-1)^n {}^nC_n a^n$$

Here nC_0 , nC_1 , nC_2 ,... , nC_n are known as binomial coefficients of order n .

- The coefficient of x^r in $(a+x)^n$ is nC_r
- The coefficient of x^r in $(a-x)^n$ is $(-1)^r {}^nC_r$

Properties of Binomial Theorem

- i. The sum of indices of x and a in each term is n .
- ii. The number of terms in $(x + a)^n$ is $n+1$.
- iii. The coefficient of terms equidistant from the beginning and the end are equal.
- iv. $(x + a)^n + (x - a)^n = 2({}^nC_0 x^n + {}^nC_2 x^{n-2} a^2 - \dots)$
- v. $(x + a)^n - (x - a)^n = 2({}^nC_1 x^{n-1} a + {}^nC_3 x^{n-3} a^3 + \dots)$

Math Talk MCQs

1. The number of non-zero terms in the expansion of $(2x + y)^n$ is (E)
A) n B) $n-1$ C) $n+1$ D) $2n$
2. The sum of all the coefficients in the binomial expansion of $(3x+4y)^8$ is (E)
A) 256 B) 128 C) 512 D) 96
3. The 4th term in the expansion of $(x - 2y)^{12}$ is (E)
A) $1760 x^3y^9$ B) $-1760 x^9y^3$ C) $1760 x^9y^3$ D) $-1760 x^3y^9$
4. The total number of terms in the expansion of $(x + a)^{100} + (x - a)^{100}$ after simplification is (E)
A) 202 B) 51 C) 50 D) 52
5. If $(1 + ax)^n = 1 + ax + 24x^2 + \dots$ then the values of a and n are (E)
A) 2, 4 B) 2, 3 C) 3, 6 D) 1, 2
6. If in the expansion of $(a-2b)^n$, the sum of the 4th and 5th term is zero, then the value of $\frac{a}{b}$ is (A)
A) $\frac{n-4}{5}$ B) $\frac{n-3}{2}$ C) $\frac{5}{n-4}$ D) $\frac{5}{2(n-4)}$
7. If the coefficient of 4th term in the expansion of $(a + b)^n$ is 56, then n is (E)
A) 12 B) 10 C) 8 D) 6
8. 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)
A) $-\frac{7}{9}$ B) $-\frac{9}{7}$ C) $\frac{7}{9}$ D) $\frac{9}{7}$
9. The coefficient of x^5 in the expansion of $(x + 3)^6$ is (E)
A) 18 B) 6 C) 12 D) 10
10. The sum of coefficients in the expansion of $(1 + x + x^2)^n$ is (D)
A) 2 B) 3^n C) 4^n D) 2^n
11. By using first three terms of its expansion, the approximate value of $(0.99)^5$ is (A)
A) 0.949 B) 0.951 C) 0.954 D) 0.945
12. The sum of all the coefficients in the binomial expansion of $(x+1)^n$ is (E)
A) 2^n B) 2^{n-1} C) n D) 2^{n+1}
13. The sum of all the coefficients in the binomial expansion of $(x-1)^n$ is (E)
A) 2^n B) 2^{n-1} C) 0 D) 2^{n+1}
14. In the expansion of $(1+x)^n$ the sum of coefficients of odd powers of x is (E)
A) 2^n B) 2^{n-1} C) 0 D) 2^{n+1}

15. In the expansion of $(1+x)^n$ the sum of coefficients of even powers of x is **(E)**
 A) 2^n B) 2^{n-1} C) 0 D) 2^{n+1}
16. $C_0 - C_1 + C_2 - C_3 + \dots + (-1)^n C_n$ is equal to **(E)**
 A) 2^n B) $2^n - 1$ C) 0 D) 2^{n-1}
17. The value of $nC_0 + 2 \cdot nC_1 + 4 \cdot nC_2 + 8 \cdot nC_3 + \dots + 2^n \cdot nC_n$ is, **(A)**
 A) 2^n B) 3^n C) 4^n D) n
18. The value of $1 + 3 \cdot 20C_1 + 9 \cdot 20C_2 + 27 \cdot 20C_3 + \dots + 3^{20}$ is **(A)**
 A) 2^{20} B) 3^{20} C) 4^{20} D) 20^2
19. $^{10}C_1 + ^{10}C_3 + ^{10}C_5 + ^{10}C_7 + ^{10}C_9 =$ **(A)**
 A) 2^9 B) 2^{10} C) $2^{10} - 1$ D) 0
20. Coefficient of x^2 in the expansion of $\left(x - \frac{1}{2x}\right)^8$ is **(D)**
 A) $\frac{1}{7}$ B) $\frac{-1}{7}$ C) -7 D) 7
21. If 21st and 22nd terms in the expansion of $(1+x)^{44}$ are equal, then x is equal to **(A)-CET-2015**
 A) $\frac{21}{22}$ B) $\frac{23}{24}$ C) $\frac{8}{7}$ D) $\frac{7}{8}$
22. The 11th term in the expansion of $\left(x + \frac{1}{\sqrt{x}}\right)^{14}$ is **(A)-CET-2017**
 A) $\frac{999}{x}$ B) $\frac{1001}{x}$ C) i D) $\frac{x}{1001}$
23. The total number of terms in the expansion of $(x+a)^{47} - (x-a)^{47}$ after simplification is **(E) - CET-2018**
 A) 24 B) 47 C) 48 D) 96
24. The number of terms in the expansion of $(x^2 + y^2)^{25} - (x^2 - y^2)^{25}$ After simplification is **(A)**
 A) 26 B) 0 C) 50 D) 13
25. The number of terms in the expansion of $(x+y+z)^{10}$ is **(D) - CET-2021**
 A) 110 B) 66 C) 142 D) 11
26. In the expansion of $(1+x)^n$, $\frac{C_1}{C_0} + 2 \frac{C_2}{C_1} + 3 \frac{C_3}{C_2} + \dots + n \frac{C_n}{C_{n-1}}$ is equal to **(D) - CET2025**
 A) $\frac{n(n+1)}{2}$ B) $\frac{n}{2}$ C) $\frac{n+1}{2}$ D) $3n(n+1)$
27. If the number of terms in the binomial expansion of $(2x+3)^{3n}$ is 22, then the value of n is **(E) CET-2026**
 A) 6 B) 7 C) 9 D) 8

28. The value at $x = 2$ for $\frac{x^3+3x^2+3x+1}{x^4+4x^3+6x^2+4x+1} =$ (A)

- A) 3 B) $\frac{25}{61}$ C) $\frac{1}{3}$ D) $\frac{19}{73}$

29. STATEMENT 1: $(1.1)^{10000}$ is greater than 1000

STATEMENT 2: $(1.1)^{10000} = (1+0.1)^{10000}$ (A)

- A) Both STATEMENT 1 and 2 are true and STATEMENT 2 is the correct explanation of the STATEMENT 1
 (B) Both STATEMENT 1 and 2 are true and STATEMENT 2 is not the correct explanation of the STATEMENT 1
 (C) STATEMENT 1 is true and STATEMENT 2 is false.
 (D) STATEMENT 1 is false and STATEMENT 1 is true

30. When divided by 25, $6n-5n$ always leaves the remainder (E)

- A) 6 B) 5 C) 1 D) 0

MATH TALK MCQS

1	2	3	4	5	6	7	8	9	10
C	A	B	B	A	B	C	D	A	B
11	12	13	14	15	16	17	18	19	20
B	A	C	B	B	C	B	C	A	C
21	22	23	24	25	26	27	28	29	30
D	B	A	D	B	A	B	C	B	C