MATHEMATICS

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Board – CBSE	Class – 11	Topic – Binomial Theorem

Very Short Answer Type Questions (1 Mark)

1. Compute $(98)^2$, using binomial theorem.
2. Expand $\left(x - \frac{1}{x}\right)^3$ using binomial theorem.
3. Write number of terms in the expansion of $(1 + 2x + x^2)10$.
4. Write number of terms in $(2a - b)^{15}$
5. Simplify:
   $\frac{{}^nC_r}{{}^nC_{r-1}}$
6. Write value of ${}^{2n-1}C_5 + {}^{2n-1}C_6 + {}^{2n}C_7$ [Hint : Use nCr + nCr–1 = n + 1Cr]
7. In the expansion,$(1 + x)^{14}$, write the coefficient of x^{12}.
8. Find the sum of the coefficients in $(x + y)^8$ [Hint : Put x = 1, y = 1]
9. If ${}^nC_{n-3} = 120$, find n. [Hint : Express 720 as the product of 3 consecutive positive integers]
10. In $\left(\frac{x}{2} - \frac{2}{x}\right)^8$, write 5th term.

Short Answer Type Questions (4 Marks)

11. If the first three terms in the expansion of (a + b)n are 27, 54 and 36 respectively, then find a, b and n.
12. In $\left(3x - \frac{1}{x^2}\right)^{18}$, which term contains x^{12}?
13. In $\left(2x - \frac{1}{x^2}\right)^{15}$, find the term independent of x.
14. Evaluate : $\left(\sqrt{2} + 1\right)^5 - \left(\sqrt{2} - 1\right)^5$ using binomial theorem.
15. Evaluate (0.9)4 using binomial theorem.
16. In the expansion of $(1 + x^2)^8$, find the difference between the coefficients of x^6 and x^4.
17. In $\left(2x - \frac{3}{x}\right)^8$, find 7^{th} term from end.
18. In $\left(2x^3 - \frac{1}{x^2}\right)^{12}$, find the coefficient of x^{11}.
19. Find the coefficient of x^4 in $(1 - x)^2\ (2 + x)^5$ using binomial theorem.
20. Find the middle term(s) in $\left(x - \frac{1}{x}\right)^8$

Long Answer Type Questions (6 Marks)

21. If the 3rd, 4th and 5th terms in the expansion of $(x + a)^n$ are 84, 280 and 560 respectively then find the values of a, x and n
22. In the expansion of $(1 - x)^{2n-1}$, find the sum of coefficients of x^{r-1} and x^{2n-r}.

Answer

1. 9604
2. $x^3 - \frac{1}{x^3} - 3x + \frac{3}{x}$
3. 21
4. 16
5. $\frac{n-r+1}{r}$
6. ${}^{2n+1}C_7$
7. 256
8. n=10
9. 70
10. $a = 3, b = 2, n = 3$
11. 9th term
12. $-2^{10} \times {}^{15}C_5$
13. 82
14. 0.6561
15. 28
16. $1628\, x^4$
17. -101376
18. 10
19. 70
20. $a = 2, x = 1, n = 7$
21. 0