PRACTICE QUESTIONS FOR COMPETITIVE EXAMINATIONS

SUB: MATHEMATICS

TOPIC 3: BINOMIAL THEOREM

1. If the coefficients of x^7 & x^8 in the expansion of $\left[2+\frac{x}{3}\right]^n$ are equal, then the value of n is -

   (A) 15 (B) 45 (C) 55 (D) 56

2. The sum of the binomial coefficients of $\left[2x+\frac{1}{x}\right]^n$ is equal to 256. The constant term in the expansion is -

   (A) 1120 (B) 2110 (C) 1210 (D) none

3. The sum of the co–efficients in the expansion of $(1 - 2x + 5x^2)^n$ is 'a' and the sum of the co–efficients in the expansion of $(1 + x)^{2n}$ is b. Then -

   (A) $a = b$ (B) $a = b^2$ (C) $a^2 = b$ (D) $ab = 1$

4. Given that the term of the expansion $(x^{1/3} - x^{-1/2})^{15}$ which does not contain x is 5 m where $m \in N$, then m is equal to -

   (A) 1100 (B) 1010 (C) 1001 (D) none

5. The expression $\frac{1}{\sqrt{4x+1}}\left[\left[\frac{1+\sqrt{4x+1}}{2}\right]^7-\left[\frac{1-\sqrt{4x+1}}{2}\right]^7\right]$ is a polynomial in x of degree -

   (A) 7 (B) 5 (C) 4 (D) 3

6. In the binomial $(2^{1/3}+3^{-1/3})^n$, if the ratio of the seventh term from the beginning of the expansion to the seventh term from its end is 1/6, then n is equal to -

   (A) 6 (B) 9 (C) 12 (D) 15

7. The term independent of x in the product $(4+x+7x^2)\left(x-\frac{3}{x}\right)^{11}$ is -

   (A) $7.{}^{11}C_6$ (B) $3^6.\ {}^{11}C_6$ (C) $3^5.\ {}^{11}C_5$ (D) $-12.\ 2^{11}$

8. If 'a' be the sum of the odd terms & 'b' be the sum of the even terms in the expansion of $(1+x)^n$, then $(1-x)^n$ is equal to -

   (A) $a - b$ (B) $a + b$ (C) $b - a$ (D) none

---

9. The sum of the co–efficients of all the even powers of x in the expansion of $(2x^2 - 3x + 1)^{11}$ is -

   (A) $2 . 6^{10}$ (B) $3 . 6^{10}$ (C) 6^{11} (D) none

10. The greatest terms of the expansion $(2x + 5y)^{13}$ when $x = 10$, $y = 2$ is -

    (A) ${}^{13}C_5 . 20^8 . 10^5$ (B) ${}^{13}C_6 . 20^7 . 10^4$ (C) ${}^{13}C_4 . 20^9 . 10^4$ (D) none of these

11. Number of rational terms in the expansion of $\left(\sqrt{2}+\sqrt[4]{3}\right)^{100}$ is -

    (A) 25 (B) 26 (C) 27 (D) 28

---

12. If $\binom{p}{q}=0$ for $p < q$, where $p, q \in W$, then $\sum_{r=0}^{\infty}\binom{n}{2r}=$

(A) 2^n (B) 2^{n-1} (C) 2^{2n-1} (D) ${}^{2n}C_n$

13. $\binom{47}{4}+\sum_{j=1}^{5}\binom{52-j}{3}=\binom{x}{y}$, then $\frac{x}{y}=$

(A) 11 (B) 12 (C) 13 (D) 14

---

14. If $n \in N$ & n is even, then $\frac{1}{1.(n-1)!}+\frac{1}{3!(n-3)!}+\frac{1}{5!(n-5)!}+.....+\frac{1}{(n-1)!1!}=$

(A) 2^n (B) $\frac{2^{n-1}}{n!}$ (C) $2^n n!$ (D) none of these

15. Let $R=(5\sqrt{5}+11)^{31}=I+f$, where I is an integer and f is the fractional part of R, then $R\ f$ is equal to -

(A) 2^{31} (B) 3^{31} (C) 2^{62} (D) 1

16. The value of $\sum_{r=0}^{10}\binom{10}{r}\binom{15}{14-r}$ is equal to -

(A) ${}^{25}C_{12}$ (B) ${}^{25}C_{15}$ (C) ${}^{25}C_{10}$ (D) ${}^{25}C_{11}$

17. $\frac{C_0}{1}+\frac{C_1}{2}+\frac{C_2}{3}+.....+\frac{C_{10}}{11}$ is equal to (here $C_r = {}^{10}C_r$)

(A) $\frac{2^{11}}{11}$ (B) $\frac{2^{11}-1}{11}$ (C) $\frac{3^{11}}{11}$ (D) $\frac{3^{11}-1}{11}$

18. If $a_n=\sum_{r=0}^{n}\frac{1}{{}^nC_r}$, then $\sum_{r=0}^{n}\frac{r}{{}^nC_r}$ equals - [JEE 98]

(A) $(n-1)\,a_n$ (B) $n\,a_n$ (C) $n\,a_n/2$ (D) none of these

19. The last two digits of the number 3^{400} are -

(A) 81 (B) 43 (C) 29 (D) 01

---

20. If the coefficients of three consecutive terms in the expansion of $(1+x)^n$ are in the ratio of 1 : 7 : 42, then n is divisible by -

(A) 9 (B) 5 (C) 3 (D) 11

Que.	1	2	3	4	5	6	7	8	9	10
Ans.	C	A	A	C	D	B	B	A	B	C
Que.	11	12	13	14	15	16	17	18	19	20
Ans.	B	B	C	B	C	D	B	C	D	B,D