INDIAN SCHOOL AL WADI AL KABIR
DEPARTMENT OF MATHEMATICS 2023 – 2024
Binomial Theorem
Work Sheet – Class XI

1	In the expansion of $\left(\frac{x}{3}-\frac{2}{x}\right)^6, x>0$, the constant term is A) $\frac{160}{27}$ B) $\frac{16}{27}$ C) $\frac{-160}{27}$ D) $\frac{120}{27}$
2	In $(1+x^3)^5$ coefficient of x^9 is (A) 5 (B) 10 (C) 1 (D) NONE
3	Number of terms in $\left(1+5\sqrt{2}x\right)^9+\left(1-5\sqrt{2}x\right)^9$ if $x>0$ *is* (A) 3 (B) 5 (C) 4 (D) 6
4	The ratio of the coefficients of x^r and x^{r-1} in $(1+x)^n$ is A) $\frac{n+r}{r}$ B) $\frac{n-r+1}{r}$ C) $\frac{n+r-1}{r}$ D) NONE
5	If the coefficient of x^2 and x^3 in the expansion of $(3+mx)^9$ are equal , then the value of m A) $-\frac{9}{7}$ B) $-\frac{7}{9}$ C) $\frac{9}{7}$ D) $\frac{7}{9}$
6	The term independent of x in the expansion of $\left(2x+\frac{1}{3x^2}\right)^6$ is A) 2^{nd} B) 3^{rd} C) 4^{th} D) 5^{th}
7	The number of terms in $((x-5)^2)^5$I A) 8 TERMS B) 9 TERMS C) 10 TERMS D)11 TERMS
8	Which one is True? A) $(1.2)^{4000}>800$ B) $(1.2)^{4000}<800$ C) $(1.2)^{4000}=800$ D)$(1.2)^{4000}=1600$
9	Find 6^{th} term in $\left(3x-\frac{2}{3x}\right)^8$
10	Find the value of $(101)^4$ by using Binomial theorem
11	Prove that $12^n-11n-1$ is divisible by 121 For all n∈N
12	Using binomial theorem, evaluate $(99)^5$.
13	Expand $\left(x^2+\frac{3}{x}\right)^4, x\neq 0$ b using Pascal triangle.

14	Find 4^{th} term of the expansion $\left(3x+\frac{2}{x}\right)^6$
15	Find $(a+b)^6-(a-b)^6$ hence evaluate $\left(\sqrt{3}+\sqrt{2}\right)^6-\left(\sqrt{3}-\sqrt{2}\right)^6$
16	Find a, if the 4th and 5th term of the expansion $(2+a)^7$ are equal.
17	Find he middle term in the expansion $\left[\frac{x}{7}-\frac{5}{x}\right]^6$
18	Find the coefficient of x^4 in $\left[2x^2-\frac{3}{x}\right]^5$
19	Find a if coefficients of x^2 and x^3 in $(3+ax)^9$ are equal.
20	Find the middle term(terms) in the expansion of $\left(3x-\frac{x^3}{6}\right)^5$
21	Find 4^{th} term of the expansion $\left(2x+\frac{3}{x}\right)^6$
22	**Case based Question**:In class XI, teacher explained binomial theorem. Two students Shivani and Vishwani trying to solve the exercise. Shivani expanded $(1+x)^6$ by using Binomial theorem, Viswani expanded $(x+1)^6$. **Based on this above information answer the following questions**. 1. According to Shivani find 4th term . (1M) 2. Find the value of $6_{C_0}+6_{C_1}+6_{C_2}+6_{C_3}+\ldots\ldots+6_{C_6}$ (1M) 3. Find the positive value of x if 3^{rd} terms of Shivani and Vishwani are equal. (2M)

Binomial Theorem (Answer Key)

1	C	2	B	3	B	4	B
5	C	6	C	7	D	8	A
9	$\frac{1729}{9}\frac{1}{x^2}$	10	104060401	12	9509900499		
13	$x^5+10x^2+40/x+80/x^4+80/x^7+32/x^{10}$						
14	4320	15	$396\sqrt{6}$	16	2	17	$-20\frac{5^3}{7^3}$
18	720	19	9/7	20	$\frac{-5x^8}{12}$	21	4320
22	(1)$20x^3$ 2)64 3) $6_{C_2}x^2=6_{C_2}x^4$ $\therefore x=\pm1$ but x is positive $\therefore x=1$						