INDIAN SCHOOL AL WADI AL KABIR

WORKSHEET 2026-27

CLASS XI **BINOMIAL THEOREM**

Questions of 1 mark each

Q.1	By using the first three terms of its expansion, the approximate value of $(0.99)^5$ is			
	A. 0.954	B. 0.951	C. 0.95	D. None of these
Q.2	The largest coefficient in the expansion of $(1+x)^{10}$ is:			
	A. $10!/(5!)^2$	B. 10! / 5!	C. $10!/(5! \times 4!)^2$	D. $10!/(5! \times 4!)$
Q.3	The number of terms in the expansion of $(1-4x+4x^2)^{15}$ is			
	A.30	B.31	C.32	D.45
Q.4	The number of terms in the expansion of $(1+3\sqrt{5}x)^7 + (1-3\sqrt{5}x)^7$ is			
	A.4	B.5	C.7	D.8
Q.5	Using the binomial theorem, the value of $(1.02)^6$ correct to three decimal places is			
	A. 1.116	B.1.126	C.1.136	D.1.206
Q.6	What is the remainder when $2^{4n} - 15n$ is divided by 225, for all $n \in \mathbb{Z}^+$.			
	A.0	B.1	C.2	D.3
Q.7	Total no. of terms in the binomial expansion of $(1-x)^{25}$ is			
	A.25	B.50	C.26	D.24
Q.8	If A and B are coefficient of x^n in the expansions of $(1+x)^{2n}$ and $(1+x)^{2n-1}$ respectively, then $\left(\frac{A}{B}\right)$ equals			
	A.1	B.2	C.$\frac{1}{2}$	D. $\frac{1}{n}$
Q.9	Total no. of negative terms in the binomial expansion of $(1-x)^{52}$ is			
	A.56	B.26	C.51	D.13
Q.10	The coefficient of x^6 in the expansion of $(x+3)^8$ is			
	A.28	B.252	C.63	D.242
Q.11	**Assertion:** $(1.1)^{10000}$ is greater than 1000 **Reason:** $(1.1)^{10000}$ can be expanded as $(1+0.1)^{10000} = 1 \times 10000 + 0.1 \times 10000 +$ other positive term.			
Q.12	**Assertion:** In the expansion of $(a+b)^n$, the sum of the indices of a and b is $n+0=n$ in thefirst term, $(n-1)+1=n$ in the second term and so on ... ...$0+n=n$ in the last term. **Reason:** $2^n = n_{c_0} + n_{c_1} + n_{c_2} + \cdots ... + n_{c_n}$			

Q.13	**Assertion:** In the expansion of $\left(ax-\frac{b}{x}\right)^6$, the coefficient of x^2 is $-6a^2$. **Reason:** Using binomial theorem we can expand as $$6_{c_0}(ax)^6+6_c,(ax)^5\left(\frac{-b}{x}\right)+6_{c_3}(ax)^4\left(\frac{-b}{x}\right)^2+\cdots\ldots+6_{c_6}\left(\frac{-b}{x}\right)^6$$
	Questions of 2 mark each
Q.14	Expand $(2x-3)^5$ completely.
Q.15	Which number is larger: $(1.2)^{4000}$ or 800 ?
Q.16	Using Binomial theorem, find the value of $(0.98)^{14}$ upto 4 places of decimal.
Q.17	By using binomial theorem show that $6^n - 5n - 1$ is divisible by 25, $n \in N$.
	Questions of 3 marks each
Q.18	Expand $\left(\sqrt{\frac{x}{y}}+\sqrt{\frac{y}{x}}\right)^4$ using the binomial theorem.
Q.19	Find $(a+b)^4-(a-b)^4$. Hence, evaluate $(\sqrt{3}+\sqrt{2})^4-(\sqrt{3}-\sqrt{2})^4$.
Q.20	Evaluate $(101)^4$ using the binomial theorem
Q.21	If the first three terms in the expansion of $(a+b)^n$ are 27, 54 and 36 respectively, then find a, b and n.
Q.22	Show that $2^{4n+4}-15n-16$ where $n \in N$ is divisible by 225.
	Questions of 5 marks each
Q.23	Find the value of $(\sqrt{2}+1)^6-(\sqrt{2}-1)^6$ and show that $(\sqrt{2}+1)^6$ lies between 197 and 198.
Q.24	Find the binomial expansion of $(1+3x)^6$. Use the expansion to find the value of $(1.003)^6$ up to 4 decimal places.
	CASE STUDY QUESTION (4 MARK)
Q.25	Four friends applied their knowledge of the Binomial Theorem while playing a game to create equations based on specific conditions. I. The coefficient of x^2 in the expansion of $(1+x)^m$ is 6, then evaluate m. II. Find the co efficient of x in $(2+x)^5$. III. Show that 11^9+9^{11} is divisible by 10.

Q.26 Pascal's triangle defines the coefficients which appear in binomial expansions. That means the nth row of Pascal's triangle comprises the coefficients of the expanded expression of the polynomial $(x + y)^n$.

Exponent :	Pascal's Triangle
0	1
1	1 1
2	1 2 1
3	1 3 3 1
4	1 4 6 4 1
5	1 5 10 10 5 1
6	1 6 15 20 15 6 1

The expansion of $(x + y)^n$ is:

$$(x + y)^n = a_0x^n + a_1x^{n-1}y + a_2x^{n-2}y^2 + \cdots + a_{n-1}xy^{n-1} + a_ny^n$$

Based on the above data answer the following questions.

I. Find the number of terms in the expansion of $(x + y)^6$

II. Find the number of terms in the expansion of $(x + y)^{10}(x - y)^{10}$

III. Find the number of terms in $(x + y)^{10} + (x - y)^{10}$

ANSWER KEY					
Q.1	B. 0.951	**Q.10**	B.252	**Q.19**	$40\sqrt{6}$
Q.2	A. $10!/(5!)^2$	**Q.11**	A	**Q.20**	104060401.
Q.3	B.31	**Q.12**	B	**Q.21**	$a = 3, b = 2,$ and $n = 3.$
Q.4	A.4	**Q.13**	D	**Q.22**	PROOF
Q.5	B.1.126	**Q.14**	$32x^5 - 240x^4 + 720x^3 - 1080x^2 + 810x - 243$	**Q.23**	$140\sqrt{2}$
Q.6	B.1	**Q.15**	$(1.2)^{4000}$ is larger than 800.	**Q.24**	$1 + 18x + 135x^2 + 540x^3 + 1215x^4 + 1458x^5 + 729x^6$ 1.0181
Q.7	C.26	**Q.16**	0.7536		
Q.8	B.2	**Q.17**	PROOF		
Q.9	B.26	**Q.18**	$\frac{x^2}{y^2} + 4\frac{x}{y} + 6 + 4\frac{y}{x} + \frac{y^2}{x^2}$		
Q25	I. 4 II. 10 III. $11^9 + 9^{11} = 10(\text{k} + \text{m})$. Therefore, it is proven to be divisible by 10.				
Q.26	I. Number of terms in $(x + y)^6 = 7$ II. Number of terms in $(x + y)^{10}(x - y)^{10} = 11$ III. Number of terms in $(x + y)^{10} + (x - y)^{10} = 6$				