Shiksha Classes Bhandara

Mathematics **Topic : Binomial Theorem** **MM 100**

Q.1 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 =
(A) 1100 (B) 1010
(C) 1001 (D) none

Q.2 The coefficient of x^{49} in the expansion of $(x - 1)\left(x-\frac{1}{2}\right)\left(x-\frac{1}{2^2}\right).....\left(x-\frac{1}{2^{49}}\right)$ is equal to
(A) $-2\left(1-\frac{1}{2^{50}}\right)$ (B) + ve coefficient of x
(C) – ve coefficient of x (D) $-2\left(1-\frac{1}{2^{49}}\right)$

Q.3 If $|x| < 2/3$ then the fourth term in the expansion of $\left(1+\frac{3}{2}x\right)^{1/2}$ is
(A) $\frac{27}{128}x^3$ (B) $-\frac{27}{128}x^3$
(C) $\frac{81}{256}x^3$ (D) $-\frac{81}{256}x^3$

Q.4 If in the expansion of $\left(2^x+\frac{1}{4^x}\right)^n$, $T_3 = 7T_2$ and sum of the binomial coefficients of second and third terms is 36, then the value of x is –
(A) –1/3 (B) – 1/2
(C) 1/3 (D) 1/2

Q.5 The greatest coefficient in the expansion of $(1 + x)^{2n}$ is
(A) $\frac{1.3.5.....(2n-1)}{n!} \cdot 2^n$ (B) ${}^{2n}C_{n-1}$
(C) ${}^{2n}C_{n+1}$ (D) None of these

Q.6 The coefficient of x^4 of in the expansion $(1 + 5x + 9x^2 + ...\infty)(1 + x^2)^{11}$ is –
(A) ${}^{11}C_2 + 4\,{}^{11}C_1 + 3$ (B) ${}^{11}C_2 + 3\,{}^{11}C_1 + 4$
(C) $3\,{}^{11}C_2 + 4\,{}^{11}C_1 + 3$ (D) 171

Q.7 Number formed by last two digits of the number $(17)^{256}$ is
(A) 81 (B) 80
(C) 91 (D) 93

Q.8 The value of cube root of 1001 up to five decimal places is
(A) 10.03333 (B) 10.00333
(C) 10.00033 (D) None of these

Q.9 The coefficient of $\lambda^n\mu^n$ in the expansion of $\left[(1+\lambda)(1+\mu)(\lambda+\mu)\right]^n$ is
(A) $\sum_{r=0}^{n} C_r^2$ (B) $\sum_{r=0}^{n} C_{r+2}^2$
(C) $\sum_{r=0}^{n} C_{r+3}^2$ (D) $\sum_{r=0}^{n} C_r^3$

Q.10 The coefficient of x^4 in the expansion of $(1 + x + x^2 + x^3)^{11}$, is
(A) 440 (B) 770
(C) 990 (D) 1001

Q.11 The coefficient of the term independent of x in the expansion of $\left(\sqrt{\frac{x}{3}}+\frac{3}{2x^2}\right)^{10}$ is
(A) 5/4 (B) 7/4
(C) 9/4 (D) none of these

Q.12 The expansion of $(1 + x)^n$ has 3 consecutive terms with coefficients in the ratio 1 : 2 : 3 and can be written in the form ${}^nC_k : {}^nC_{k+1} : {}^nC_{k+2}$. The sum of all possible values of (n + k) is –
(A) 18 (B) 21
(C) 28 (D) 32

Q.13 The sum of the coefficient of all the terms in the expansion of $(2x – y + z)^{20}$ in which y do not appear at all while x appears in even powers and z appears in odd powers is –
(A) 0 (B) $\frac{2^{20}-1}{2}$
(C) 2^{19} (D) $\frac{3^{20}-1}{2}$

Q.14 The coefficient of x^{53} in the expansion, $\sum_{m=0}^{100} {}^{100}C_m (x-3)^{100-m} \cdot 2^m$ is
(A) ${}^{100}C_{47}$ (B) ${}^{100}C_{53}$
(C) $-{}^{100}C_{53}$ (D) $-{}^{100}C_{100}$

Q.15 The sum of the co–efficient of all the even powers of x in the expansion of $(2x^2 – 3x + 1)^{11}$ is :
(A) $2 \cdot 6^{10}$ (B) $3 \cdot 6^{10}$
(C) 6^{11} (D) none

Q.16 If the coefficients of second, third and fourth terms in the expansion of $(1 + x)^{2n}$ are in A.P., then –
(A) $2n^2 – 9n + 7 = 0$ (B) $2n^2 + 5n + 7 = 0$
(C) $n^2 – 9n + 7 = 0$ (D) None of these

Q.17 The value of $\frac{(18^3+7^3+3\times18\times7\times25)}{3^6+6\times243\times2+15\times81\times4+20\times27\times8+15\times9\times16+6\times3\times32+64}$ is –
(A) 0 (B) 1
(C) 2 (D) None of these

Q.18 If $(1 + x)^n = a_0 + a_1x + a_2x^2 + \ldots + a_nx^n$, then $\left(1+\frac{a_1}{a_0}\right)\left(1+\frac{a_2}{a_1}\right)\left(1+\frac{a_3}{a_2}\right)\ldots\left(1+\frac{a_n}{a_{n-1}}\right)$ is equal to
(A) $\frac{n^n}{n!}$ (B) $\frac{(n+1)^n}{n!}$
(C) $\frac{n^{n+1}}{(n+1)!}$ (D) none of these.

Q.19 The value of $\left\{\frac{3^{2003}}{28}\right\}$, where $\{\cdot\}$ denotes the fractional part, is equal to

(A) 15/28 (B) 5/28

(C) 19/28 (D) 9/28

Q.20 In the expansion of $\left(\sqrt[3]{\frac{a}{b}}+\sqrt[3]{\frac{b}{\sqrt{a}}}\right)^{21}$ the term containing same powers of a and b is –

(A) 11^{th} (B) 13^{th}

(C) 12^{th} (D) 6^{th}

For Q.21-Q.25 :

The answer to each question is a NUMERICAL VALUE.

Q.21 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 –

Q.22 If $6^{83} + 8^{83}$ is divided by 49, then the remainder is –

Q.23 If the 3rd term in the expansion of $(x + x^t)^5$ is 10^6 where $t = \log_{10} x$ then the number of possible values of x is –

Q.24 $\left(x+\sqrt{x^3-1}\right)^5+\left(x-\sqrt{x^3-1}\right)^5$ is a polynomial of the order of –

Q.25 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 equal to –