EXERCISE – I SINGLE CORRECT (OBJECTIVE QUESTIONS)

1. If 'a' be the sum of the odd terms & 'b' the sum of the even terms in the expansion of $(1+x)^n$, then $(1-x^2)^n$ equals

(A) $a^2 - b^2$ (B) $a^2 + b^2$ (C) $b^2 - a^2$ (D) none

Sol.

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

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

Sol.

3. 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 equals

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

Sol.

4. Let n be a positive integer. Then of the following, the greatest term is

(A) $\left(1+\frac{1}{4n}\right)^{4n}$ (B) $\left(1+\frac{1}{3n}\right)^{3n}$ (C) $\left(1+\frac{1}{2n}\right)^{2n}$ (D) $\left(1+\frac{1}{n}\right)^{n}$

Sol.

Sol.

5. 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

Sol.

6. 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

Sol.

7. 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

Sol.

8. If $n \in N$ & n is even, then

$\frac{1}{1.(n-1)!}+\frac{1}{3!(n-3)!}+\frac{1}{5!(n-5)!}+.....+\frac{1}{(n-1)!1!}$ equals

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

Sol.

9. The sum of the series
$(1^2 + 1)\, 1! + (2^2 + 1).2! + (3^2 + 1).3! ....+(n^2 + 1).\, n!$
is
(A) (n + 1).(n + 2) ! (B) n. (n + 1) !
(C) (n + 1).(n + 1) ! (D) none of these
Sol.

10. The last two digits of the number 3^{400} are
(A) 81 (B) 43 (C) 29 (D) 01
Sol.

11. 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
Sol.

12. 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
Sol.

13. 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
Sol.

14. Set of values of r for which,
$^{18}C_{r-2} + 2.^{18}C_{r-1} + {}^{18}C_r \geq {}^{20}C_{13}$ contains
(A) 4 elements (B) 5 elements
(C) 7 elements (D) 10 elements
Sol.

15. 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
Sol.

16. The binomial expansion of $\left(x^k + \frac{1}{x^{2k}}\right)^{3n}$, $n \in N$ contains a term independent of x

(A) only if k is an integer

(B) only if k is a natural number

(C) only if k is rational

(D) for any real k

Sol.

17. $\frac{C_0}{1} + \frac{C_1}{2} + \frac{C_2}{3} + ... + \frac{C_{10}}{11} =$

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

Sol.

18. Let $\left(5+2\sqrt{6}\right)^n = p + f$ where $n \in N$ and $p \in N$ and $0 < f < 1$ then the value, $f^2 - f + pf - p$ is

(A) a natural number (B) a negative integer

(C) a prime number (D) an irrational number

Sol.

19. The coefficient of $x^r (0 \le r \le n-1)$ in the expression $(x+2)^{n-1} + (x+2)^{n-2} . (x+1) + (x+2)^{n-3} . (x+1)^2 + ...+ (x+1)^{n-1}$ is

(A) ${}^nC_r(2^r - 1)$ (B) ${}^nC_r(2^{n-r} - 1)$

(C) ${}^nC_r(2^r + 1)$ (D) ${}^nC_r(2^{n-r} + 1)$

Sol.

20. If $(1 + x + x^2)^{25} = a_0 + a_1x + a_2x^2 + ...+a_{50}. x^{50}$ then $a_0 + a_2 + a_4 + ...+ a_{50}$ is

(A) even

(B) odd & of the form 3n

(C) odd & of the form (3n – 1)

(D) odd & of the form (3n + 1)

Sol.

21. The co-efficient of x^4 in the expansion of $(1 – x + 2x^2)^{12}$ is

(A) ${}^{12}C_3$ (B) ${}^{13}C_3$

(C) ${}^{14}C_4$ (D) ${}^{12}C_3 + 3\ {}^{13}C_3 + {}^{14}C_4$

Sol.

22. If $\sum_{k=1}^{n-r} {}^{n-k}C_r = {}^{x}C_y$ then

(A) x = n + 1 ; y = r (B) x = n ; y = r + 1

(C) x = n ; y = r (D) x = n + 1 ; y = r + 1

Sol.

23. Coefficient of α^t in the expansion of $(\alpha+p)^{m-1} + (\alpha+p)^{m-2}(\alpha+q) + (\alpha+p)^{m-3}(\alpha+q)^2 + ...(\alpha+q)^{m-1}$ where $\alpha \neq -q$ and $p \neq q$ is

(A) $\frac{{}^mC_t(p^t - q^t)}{p-q}$ (B) $\frac{{}^mC_t(p^{m-t} - q^{m-t})}{p-q}$

(C) $\frac{{}^mC_t(p^t + q^t)}{p-q}$ (D) $\frac{{}^mC_t(p^{m-t} + q^{m-t})}{p-q}$

Sol.

24. The co-efficient of x^{401} in the expansion of $(1 + x + x^2 + ...+x^9)^{-1}$, $(|x| < 1)$ is

(A) 1 (B) –1 (C) 2 (D) – 2

Sol.

25. Number of terms free from radical sign in the expansion of $(1 + 3^{1/3} + 7^{1/7})^{10}$ is

(A) 4 (B) 5 (C) 6 (D) 8

Sol.

26. In the expansion of $(1 + x)^n (1 + y)^n (1 + z)^n$, the sum of the co-efficients of the terms of degree 'r' is

(A) ${}^{n^3}C_r$ (B) ${}^nC_{r^3}$ (C) ${}^{3n}C_r$ (D) 3. ${}^{2n}C_r$

Sol.