DPP-02

1. If in the expansion of $(x + a)^n$, then sum of the odd terms is A and that of even terms is B, then the value of $(x^2 - a^2)^n$ is

(A) $A^2 + B^2$ (B) $A^2 - B^2$ (C) $4AB$ (D) $2(A - B)$

2. In the expansion of $(x + 1/x)^{2n} (n \in N)$, the middle term is

(A) $\frac{1 \cdot 3 \cdot 5 \ldots\ldots (2n-1)}{\lfloor n} 2^n$ (B) $\frac{\lfloor 2n}{\lfloor n}$ (C) $\frac{\lfloor 2n}{\lfloor n} 2^n$ (D) $\frac{\lfloor n}{\lfloor 2n}$

3. The value of $(\sqrt{2} + 1)^6 + (\sqrt{2} - 1)^6$ is equal to

(A) 198 (B) -198 (C) 99 (D) -99

4. If in the expansion of $(x^4 - 1/x^3)^{15}$, x^{-17} occurs in the nth term, then

(A) $r = 10$ (B) $r = 11$ (C) $r = 12$ (D) $r = 13$

5. The value of the middle term in the expansion of $\left(\frac{x\sqrt{y}}{3} - \frac{3}{y\sqrt{x}}\right)^{12}$

(A) $C(12,7)x^3y^{-3}$ (B) $C(12,6)x^3y^{-3}$ (C) $C(12,7)x^{-3}y^3$ (D) $C(12,6)x^{-3}y^3$

6. If the sum of all the coefficients in the expansion of $\left(x^{3/2} + x^{-1/3}\right)^n$ is 128 , then the coefficient of x^5 will be

(A) 7 (B) 21 (C) 35 (D) 45

7. The value of $(\sqrt{3} + 1)^{2n} - (\sqrt{3} - 1)^{2n}, n \in \mathbf{N}$ is

(A) an irrational number (B) a rational number

(C) an even integer (D) an odd integer

8. If $n \in N$, then $(\sqrt{5} + 1)^{2n+1} - (\sqrt{5} - 1)^{2n+1}$ is

(A) an even integer (B) an odd integer

(C) irrational (D) rational

9. The middle term in the expansion of $(1 - 3x + 3x^2 - x^3)^6$ is

(A) ${}^{18}C_{10}x^{10}$ (B) ${}^{18}C_9(-x)^9$ (C) ${}^{18}C_0x^9$ (D) $-{}^{18}C_{10}x^{10}$

10. The number of rational terms in the expansion of $\left(7^{1/3} + 11^{1/9}\right)^{6561}$ is equal to

(A) 730 (B) 721 (C) 728 (D) none of these

11. If $a = (\sqrt{3} + 1)^7$, then [a] is equal to (where [ ] is the greatest integer function)

(A) 1138 (B) 1137 (C) 1136 (D) 968

12. The remainder when 2^{2000} is divided by 17 is

(A) 8 (B) 11 (C) 2 (D) 1

13. In the expansion of $(4 - 3x)^7$ when $x = 2/3$, the numerically greatest term is

(A) T_4 (B) T_3 (C) T_5^4 (D) none of these

14. If a_1, a_2, a_3, a_4 are coefficients of T_2, T_3, T_4 and T_5 respectively in $(1+x)^n$; then $\frac{a_1}{a_1+a_2}+\frac{a_3}{a_3+a_4}$ equals

(A) $\frac{a_2}{a_2+a_3}$ (B) $\frac{2a_2}{a_2+a_3}$ (C) $\frac{-a_2}{a_2+a_3}$ (D) $\frac{a_2}{2(a_2+a_3)}$

15. In the expansion of $\left(\frac{1}{2}x^{1/3}+x^{-1/5}\right)^8$, the term independent of x is

(A) T_5 (B) T_6 (C) T_7 (D) T_8

16. The value of $(\sqrt{5}+1)^5-(\sqrt{5}-1)^5$ is

(A) 352 (B) 252 (C) 452 (D) 532

Ans. **(A)**

Sol. Exp $=2[T_2+T_4+T_6]$

$=2\left[{}^5C_1(\sqrt{5})^4+{}^5C_3(\sqrt{5})^2+{}^5C_5(\sqrt{5})^0\right]=2[125+50+1]=352$

17. If three consecutive coefficients in the expansion of $(1+x)^n$ are 28,56 and 70 , then the value of n is

(A) 4 (B) 6 (C) 8 (D) 10

18. The number of terms in the expansion of $[(x+3y)^2(3x-y)^2]^3$ is

(A) 14 (B) 28 (C) 32 (D) 56

19. The middle term in the expansion of $(1+x)^{2n}(n\in \mathbf{N})$ is

(A) $\frac{1\cdot3\cdot5.....\cdot(2n+1)}{\lfloor n}2^n x^n$ (B) $\frac{1\cdot3\cdot5.....\cdot(2n-1)}{\lfloor n}2^n x^n$

(C) $\frac{1\cdot3\cdot5.....\cdot(2n-1)}{\lfloor n}2^{n-1} x^n$ (D) $\frac{1\cdot3\cdot5.....\cdot(2n+1)}{\lfloor n}2^{n+1} x^n$

20. In the expansion of $\left(\frac{2\sqrt{x}}{5}-\frac{1}{2x\sqrt{x}}\right)^{11}$, the term independent of x is

(A) no term (B) 5th term (C) 6th term (D) 11th term

21. In the expansion of $\left(x^2-\frac{1}{3x}\right)^9$, the term without x is equal to

(A) 28/81 (B) $-28/243$ (C) 28/243 (D) none of these

22. The middle term in the expansion of $\left(\frac{2x^2}{3}+\frac{3}{2x^2}\right)^{10}$ is

(A) 251 (B) 252 (C) 250 (D) none of these

23. In how many terms in the expansion of $\left(x^{1/5}+y^{1/10}\right)^{55}$ do not have fractional power of the variable

(A) 6 (B) 7 (C) 8 (D) 10

ANSWER KEY

1.	(B)	**2.**	(A)	**3.**	(A)	**4.**	(C)	**5.**	(B)	**6.**	(C)	**7.**	(A)
8.	(A)	**9.**	(B)	**10.**	(A)	**11.**	(C)	**12.**	(D)	**13.**	(B)	**14.**	(B)
15.	(B)	**16.**	(A)	**17.**	(C)	**18.**	(B)	**19.**	(B)	**20.**	(A)	**21.**	(C)
22.	(B)	**23.**	(A)										