Straight Objective Type

1. The co-efficient of x^5 in the expansion of $(1+x)^{21} + (1+x)^{22} + \ldots\ldots\ldots + (1+x)^{30}$ is
   (A) ${}^{51}C_5$ (B) ${}^{9}C_5$ (C) ${}^{31}C_6 - {}^{21}C_6$ (D) ${}^{30}C_5 - {}^{20}C_5$

2. The co-efficient of x^5 in th expansion $(x^2 - x - 2)^5$ is
   (A) – 83 (B) – 82
   (C) – 86 (D) – 81

3. In the expansion of $\left(5^{\frac{1}{2}} + 7^{\frac{1}{8}}\right)^{1024}$, the no. of integral term is
   (A) 128 (B) 129 (C) 130 (D) 131

4. The value of ${}^{15}C_0^2 - {}^{15}C_1^2 + {}^{15}C_2^2 - \ldots\ldots\ldots\ldots - {}^{15}C_{15}^2$ is
   (A) 15 (B) – 15 (C) 0 (D) 51

5. If C_r stands for ${}^{n}C_r$, then the sum of the series (where n is an even positive integer,)
   $\frac{2\left(\frac{n}{2}\right)!\left(\frac{n}{2}\right)!}{n!}\left[C_0^2 - 2C_1^2 + 3C_2^3 - \ldots\ldots + (-1)^n(n+1)C_n^2\right]$ is equal to
   (A) 0 (B) $(-1)^{n/2}(n+1)$ (C) $(-1)^n(n+2)$ (D) none of these

6. The expression $\{x + (x^3 - 1)^{1/2}\}^5 + \{x - (x^3 - 1)^{1/2}\}^5$ is a polynomial of degree
   (A) 5 (B) 6 (C) 7 (D) 8

7. If $R = \left(5\sqrt{5} + 11\right)^{2n+1}$ and f= R – [R] then Rf must be equal to
   (A) 5^{2n+1} (B) 11^{2n+1} (C) 4^{2n+1} (D) 1

8. The number of irrational terms in the expansion of $\left(\sqrt[4]{9} + \sqrt[6]{8}\right)^{500}$ is
   (A) 459 (B) 41 (C) 40 (D) 460

Multiple Correct Choice Type

9. The sum of the co-efficient in the expansion of $(1 + ax - 2x^2)^n$ is
   (A) +ve, when a < 1 and n = 2 k, $k \in N$ (B) –ve, when a < 1 and n = 2k +1, $k \in N$
   (C) +ve, when a > 1 and $n \in N$ (D) zero, when a = 1

10. If for z as real or complex, $\left(1 + z^2 + z^4\right)^8 c_0 + c_1 z^2 + c_2 z^4 + \ldots\ldots\ldots + c_{16} z^{32}$ then
    (A) $c_0 - c_1 + c_2 - c_3 + \ldots\ldots\ldots + c_{16} = 1$ (B) $c_0 + c_3 + c_6 + c_9 + c_{12} + c_{15} = 3^7$
    (C) $c_2 + c_5 + c_8 + c_{11} + c_{14} = 3^6$ (D) $c_1 + c_4 + c_7 + c_{10} + c_{13} + c_{16} = 3^7$

Comprehension Type

The 2nd, 3rd and 4th terms in the expansion of $(x + a)^n$ are 240, 720 and 1080, respectively.

11. The value of $(x - a)^n$ can be
    (A) 64 (B) – 1 (C) – 32 (D) none of these

12. The value of least term in the expansion is
    (A) 16 (B) 160 (C) 32 (D) 81

13. The sum of odd numbered terms is
(A) 1664 (B) 2376 (C) 1562 (D) 1486

Integer Type

14. The value of $\sum_{i=0}^{10}\sum_{j=0}^{10} {}^{10}C_i\,{}^{10}C_j - \sum_{i}\sum_{\neq j} {}^{10}C_i\,{}^{10}C_j$ is ${}^{n}C_r$ then the value of $\left(\frac{n}{r}\right)$ is

15. Let $\left(\sqrt{2}+1\right)^6 = I + f$ where $0 < f < 1$ and I is an integer then the value of $(I + f)(1-f)$ is

Matrix – Match Type

16. Match the following

Column – I		Column – II	
(A)	The co-efficient of two consecutive terms in the expansion of $(1 + x)^n$ will be ~~exclude~~ equal, then n can be	(p)	9
(B)	If $15^n + 23^n$ is divided by 19 then n can be	(q)	10
(C)	${}^{10}C_0 \cdot {}^{20}C_{10} - {}^{10}C_1 \cdot {}^{18}C_{10} + {}^{10}C_2 \cdot {}^{16}C_{10} - \ldots\ldots$ is divisible by 2^n, then n can be	(r)	11
(D)	If the co-efficient of T_r, T_{r+1}, T_{r+2} terms of $(1 + x)^{14}$ are in A.P, then r is less than	(s)	12