MATHEMATICS

DPP

DAILY PRACTICE PROBLEMS

DPP No. 65

Total Marks : 51

Max. Time : 48 min.

Topic : Binomial Theorem

Type of Questions		**M.M., Min.**
Single choice Objective (no negative marking) Q.1 to 12	**(3 marks, 3 min.)**	**[36, 36]**
Multiple choice objective (no negative marking) Q.13, 14, 15	**(5 marks, 4 min.)**	**[15, 12]**

1. In the expansion of $\left(x^3 - \frac{1}{x^2}\right)^n$, $n \in N$, if the sum of the coefficients of x^5 and x^{10} is 0, then n is :

(A) 25 (B) 20 (C) 15 (D) None of these

2. The sum of the coefficients of all the integral powers of x in the expansion of $\left(1+2\sqrt{x}\right)^{40}$ is :

(A) $3^{40} + 1$ (B) $3^{40} - 1$ (C) $\frac{1}{2}(3^{40} - 1)$ (D) $\frac{1}{2}(3^{40} + 1)$

3. The coefficient of the term independent of x in the expansion of $\left(\frac{x+1}{x^{\frac{2}{3}} - x^{\frac{1}{3}} + 1} - \frac{x-1}{x - x^{\frac{1}{2}}}\right)^{10}$ is :

(A) 70 (B) 112 (C) 105 (D) 210

4. Coefficient of x^{n-1} in the expansion of, $(x + 3)^n + (x + 3)^{n-1}(x + 2) + (x + 3)^{n-2}(x + 2)^2 + \ldots + (x + 2)^n$ is :

(A) ${}^{n+1}C_2(3)$ (B) ${}^{n-1}C_2(5)$ (C) ${}^{n+1}C_2(5)$ (D) ${}^{n}C_2(5)$

5. Let $f(n) = 10^n + 3.4^{n+2} + 5$, $n \in N$. The greatest value of the integer which divides f(n) for all n is :

(A) 27 (B) 9 (C) 3 (D) None of these

6. If $\{x\}$ denotes the fractional part of 'x', then $\left\{\frac{3^{1001}}{82}\right\}$ =

(A) 9/82 (B) 81/82 (C) 3/82 (D) 1/82

7. The sum $\sum_{r=0}^{n} (r + 1)\, C_r^2$ is equal to :

(A) $\frac{(n+2)(2n-1)!}{n!\,(n-1)!}$ (B) $\frac{(n+2)(2n+1)!}{n!\,(n-1)!}$ (C) $\frac{(n+2)(2n+1)!}{n!\,(n+1)!}$ (D) $\frac{(n+2)(2n-1)!}{n!\,(n+1)!}$

8. If $a_n = \sum_{r=0}^{n} \frac{1}{{}^nC_r}$, the value of $\sum_{r=0}^{n} \frac{n-2r}{{}^nC_r}$ is :

(A) $\frac{n}{2} a_n$ (B) $\frac{1}{4} a_n$ (C) na_n (D) 0

9. The sum of the series $\sum_{r=1}^{n} (-1)^{r-1}.\, {}^nC_r (a - r)$ is equal to :

(A) $n \cdot 2^{n-1} + a$ (B) 0 (C) a (D) None of these

10. The sum of: $3.{}^nC_0 - 8.{}^nC_1 + 13.{}^nC_2 - 18.{}^nC_3 + \ldots$ upto (n+1) terms is :
(A) zero (B) 1 (C) 2 (D) none of these

11. The number of terms in the expansion of $\left(x^2 + 1 + \frac{1}{x^2}\right)^n$, $n \in N$, is :
(A) 2n (B) 3n (C) 2n + 1 (D) 3n + 1

12. If $(1 + x + 2x^2)^{20} = a_0 + a_1x + a_2x^2 + \ldots\ldots\ldots + a_{40}x^{40}$, then $a_0 + a_2 + a_4 \ldots\ldots + a_{38}$ is equal to :
(A) $2^{19}(2^{30} + 1)$ (B) $2^{19}(2^{20} - 1)$
(C) $2^{20}(2^{19} - 1)$ (D) none of these

13. In the expansion of $\left(\sqrt[3]{4} + \frac{1}{\sqrt[4]{6}}\right)^{20}$
(A) the number of irrational terms is 19 (B) middle term is irrational
(C) the number of rational terms is 2 (D) 9th term is rational

14. If $\left(9 + \sqrt{80}\right)^n = I + f$, where I, n are integers and $0 < f < 1$, then :
(A) I is an odd integer (B) I is an even integer
(C) $(I + f)(1 - f) = 1$ (D) $1 - f = \left(9 - \sqrt{80}\right)^n$

15. $7^9 + 9^7$ is divisible by :
(A) 16 (B) 24 (C) 64 (D) 72

Answers Key

1. (C) **2.** (D) **3.** (D) **4.** (C)

5. (B) **6.** (C) **7.** (A) **8.** (D)

9. (C) **10.** (A) **11.** (C) **12.** (B)

13. (A, B, C, D) **14.** (A, C, D) **15.** (A, C)