MATHEMATICS

DPP

DAILY PRACTICE PROBLEMS

DPP No. 62

Total Marks : 36

Max. Time : 36 min.

Topic : Binomial Theorem

Type of Questions		**M.M., Min.**
Single choice Objective (no negative marking) Q.1,3,4,5,6,9	(3 marks, 3 min.)	[18, 18]
Multiple choice objective (no negative marking) Q.7,8	(5 marks, 4 min.)	[10, 8]
Subjective Questions (no negative marking) Q.2,10	(4 marks, 5 min.)	[8, 10]

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

2. Find the term in the expansion of $(2x - 5)^6$ which have

(i) Greatest binomial coefficient (ii) Greatest numerical coefficient

(iii) Algebraically greatest coefficient (iv) Algebraically least coefficient

3. The value of $\frac{C_0}{1.3} - \frac{C_1}{2.3} + \frac{C_2}{3.3} - \frac{C_3}{4.3} + \dots\dots\dots + (-1)^n \frac{C_n}{(n+1).3}$ is :

(A) $\frac{3}{n+1}$ (B) $\frac{n+1}{3}$ (C) $\frac{1}{3(n+1)}$ (D) none of these

4. The value of the expression ${}^{47}C_4 + \sum_{j=1}^{5} {}^{52-j}C_3$ is equal to:

(A) ${}^{47}C_5$ (B) ${}^{52}C_5$ (C) ${}^{52}C_4$ (D) ${}^{49}C_4$

5. The value of $\binom{50}{0}\binom{50}{1} + \binom{50}{1}\binom{50}{2} + \dots\dots\dots\dots + \binom{50}{49}\binom{50}{50}$ is, where ${}^nC_r = \binom{n}{r}$

(A) $\binom{100}{50}$ (B) $\binom{100}{51}$ (C) $\binom{50}{25}$ (D) $\binom{50}{25}^2$

6. If $|x| < 1$, then the co-efficient of x^n in the expansion of $(1 + x + x^2 + x^3 + \dots\dots.)^2$ is

(A) n (B) n – 1 (C) n + 2 (D) n + 1

7. If the expansion of $(3x + 2)^{-1/2}$ is valid in ascending powers of x, then x lies in the interval.

(A) (0, 2/3) (B) (–3/2, 3/2) (C) (–2/3, 2/3) (D) $(-\infty, -3/2) \cup (3/2, \infty)$

8. The coefficient of x^4 in $\left(\frac{1+x}{1-x}\right)^2$, $|x| < 1$, is

(A) 4 (B) –4 (C) $10 + {}^4C_2$ (D) 16

9. 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) ${}^{12}C_3 + 3\ {}^{13}C_3 + {}^{14}C_4$

10. If $(1 + x)^n = C_0 + C_1 x + C_2 x^2 + \dots\dots\dots + C_n x^n$, prove that

(i) $C_0 C_3 + C_1 C_4 + \dots\dots\dots + C_{n-3} C_n = \frac{(2n)!}{(n+3)!(n-3)!}$

(ii) $C_0 C_r + C_1 C_{r+1} + \dots\dots\dots\dots + C_{n-r} C_n = \frac{(2n)!}{(n+r)!(n-r)!}$

(iii) $C_0^2 - C_1^2 + C_2^2 - C_3^2 + \dots\dots\dots + (-1)^n C_n^2 = 0$ or $(-1)^{n/2} C_{n/2}$ according as n is odd or even.

Answers Key

1. (C) **2** (i) T_4 (ii) T_5, T_6 (iii) T_5 (iv) T_6

3. (C) **4.** (C) **5.** (B) **6.** (D)

7. (A)(C) **8.** (C)(D) **9.** (D)