MATHEMATICS

DPP

DAILY PRACTICE PROBLEMS

DPP No. 60

Total Marks : 51

Max. Time : 57 min.

Topic : Binomial Theorem

Type of Questions		**M.M., Min.**
Single choice Objective (no negative marking) Q.1 to 9	**(3 marks, 3 min.)**	**[27, 27]**
Subjective Questions (no negative marking) Q.10,11,12,13,14,15	**(4 marks, 5 min.)**	**[24, 30]**

1. The term independent of x in the expansion of $\left(x-\frac{1}{x}\right)^4\left(x+\frac{1}{x}\right)^3$ is:

(A) – 3 (B) 0 (C) 1 (D) 3

2. Let the co-efficients of x^n in $(1 + x)^{2n}$ & $(1 + x)^{2n-1}$ be P & Q respectively, then $\left(\frac{P+Q}{Q}\right)^5 =$

(A) 9 (B) 27 (C) 81 (D) none of these

3. The value of m, for which the coefficients of the $(2m + 1)^{th}$ and $(4m + 5)^{th}$ terms in the expansion of $(1 + x)^{10}$ are equal, is

(A) 3 (B) 1 (C) 5 (D) 8

4. If $k \in R$ and the middle term of $\left(\frac{k}{2}+2\right)^8$ is 1120, then value of k is:

(A) 3 (B) 2 (C) – 3 (D) – 4

5. The remainder when 2^{2003} is divided by 17 is :

(A) 1 (B) 2 (C) 8 (D) none of these

6. The last two digits of the number 3^{400} are:

(A) 81 (B) 43 (C) 29 (D) 01

7. The last three digits in 10 ! are :

(A) 800 (B) 700 (C) 500 (D) 600

8. The value of $\sum_{r=1}^{10} r \cdot \frac{{}^nC_r}{{}^nC_{r-1}}$ is equal to

(A) 5 (2n – 9) (B) 10 n (C) 9 (n – 4) (D) none of these

9. $\sum_{r=0}^{n-1} \frac{{}^nC_r}{{}^nC_r + {}^nC_{r+1}} =$

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

10. Find the middle term(s) in the expansion of

(i) $\left(\frac{x}{y} - \frac{y}{x}\right)^7$ (ii) $(1 - 2x + x^2)^n$

11. Prove that the co-efficient of the middle term in the expansion of $(1 + x)^{2n}$ is equal to the sum of the co-efficients of middle terms in the expansion of $(1 + x)^{2n-1}$.

12. Show that the middle term in the expansion of $(1 + x)^{2n}$ is, $\frac{1 . 3 . 5 . ... (2n - 1)}{n!}\ 2^n . x^n$.

13. (i) Find the remainder when 7^{98} is divided by 5

(ii) Using binomial theorem prove that $6^n - 5n$ always leaves the remainder 1 when divided by 25.

(iii) Find the last digit, last two digits and last three digits of the number $(27)^{27}$.

14. Which is larger : $(99^{50} + 100^{50})$ or $(101)^{50}$.

15. Find numerically greatest term(s) in the expansion of $(3 - 5x)^{15}$ when $x = \frac{1}{5}$

Answers Key

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

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

9. (A) **10.** (i) $-\frac{35x}{y}, \frac{35y}{x}$ (ii) $(-1)^n \frac{(2n)!}{n!\, n!} x^n$

13. (i) 4 (iii) 3, 03, 803 **14.** 101^{50}

15. $T_4 = -455 \times 3^{12}$ and $T_5 = 455 \times 3^{12}$