MATHEMATICS

DPP

DAILY PRACTICE PROBLEMS

DPP No. 64

Total Marks : 32

Max. Time : 34 min.

Topics : Binomial Theorem, Permutation & Combination

Type of Questions		**M.M., Min.**
Single choice Objective (no negative marking) Q.1,2,3,4,5,6,7,9	**(3 marks, 3 min.)**	**[24, 24]**
Subjective Questions (no negative marking) Q.8, 10	**(4 marks, 5 min.)**	**[8, 10]**

1. If $(1 + x)^n = \sum_{r=0}^{n} a_r x^r$ and $b_r = 1 + \frac{a_r}{a_{r-1}}$ and $\prod_{r=1}^{n} b_r = \frac{(101)^{100}}{100!}$, then n equals to :

(A) 99 (B) 100 (C) 101 (D) None of these

2. The number of values of 'r' satisfying the equation, ${}^{39}C_{3r-1} - {}^{39}C_{r^2} = {}^{39}C_{r^2-1} - {}^{39}C_{3r}$ is :

(A) 1 (B) 2 (C) 3 (D) 4

3. Number of elements in set of values of r for which, ${}^{18}C_{r-2} + 2.\ {}^{18}C_{r-1} + {}^{18}C_r \geq {}^{20}C_{13}$ is satisfied :

(A) 4 (B) 5 (C) 7 (D) 10

4. The coefficient of x^{52} in the expansion $\sum_{m=0}^{100} {}^{100}C_m\ (x-3)^{100-m}.\ 2^m$ is :

(A) ${}^{100}C_{47}$ (B) ${}^{100}C_{48}$ (C) $-{}^{100}C_{52}$ (D) $-{}^{100}C_{100}$

5. The sum $\frac{1}{1!\,(n-1)!} + \frac{1}{2!\,(n-2)!} + \ldots\ldots \frac{1}{1!\,(n-1)!}$ is equal to :

(A) $\frac{1}{n!}(2^{n-1} - 1)$ (B) $\frac{2}{n!}(2^n - 1)$ (C) $\frac{2}{n!}(2^{n-1} - 1)$ (D) None

6. The co-efficient of x^5 in the expansion of $(1 + x)^{21} + (1 + x)^{22} + \ldots\ldots + (1 + x)^{30}$ is :

(A) ${}^{51}C_5$ (B) ${}^{9}C_5$ (C) ${}^{31}C_6 - {}^{21}C_6$ (D) ${}^{30}C_5 + {}^{20}C_5$

7. If $(1 + x + x^2 + x^3)^5 = a_0 + a_1x + a_2x^2 + \ldots\ldots\ldots\ldots\ldots + a_{15}x^{15}$, then a_{10} equals to :

(A) 99 (B) 101 (C) 100 (D) 110

8. Find the sum of the following infinite series : $\frac{1}{2}\left(\frac{1}{5}\right)^2 + \frac{2}{3}\left(\frac{1}{5}\right)^3 + \frac{3}{4}\left(\frac{1}{5}\right)^4 + \ldots.$

9. Numbers of natural numbers smaller than ten thousand and divisible by 4 using the digits 0, 1, 2, 3 and 5 without repetition is :

(A) 18 (B) 27 (C) 32 (D) 31

10. How many 3–digit odd numbers can be formed using the digits 1, 2, 3, 4, 5, 6 if

(i) The repetition of digits is not allowed ?

(ii) The repetition of digits is allowed ?

Answers Key

1. (B) **2.** (B) **3.** (C) **4.** (B) **5.** (C) **6.** (C)

7. (B) **8.** $\frac{1}{4} + \log_e \frac{4}{5}$ **9.** (D) **10.** 60, 108