

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]

- 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
- 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
- Number of elements in set of values of r for which, ${}^{18}C_{r-2} + 2 \cdot {}^{18}C_{r-1} + {}^{18}C_r \geq {}^{20}C_{13}$ is satisfied :
(A) 4 (B) 5 (C) 7 (D) 10
- The coefficient of x^{52} in the expansion $\sum_{m=0}^{100} {}^{100}C_m (x-3)^{100-m} \cdot 2^m$ is :
(A) ${}^{100}C_{47}$ (B) ${}^{100}C_{48}$ (C) $-{}^{100}C_{52}$ (D) $-{}^{100}C_{100}$
- The sum $\frac{1}{1!(n-1)!} + \frac{1}{2!(n-2)!} + \dots + \frac{1}{1!(n-1)!}$ 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
- The co-efficient of x^5 in the expansion of $(1+x)^{21} + (1+x)^{22} + \dots + (1+x)^{30}$ is :
(A) ${}^{51}C_5$ (B) 9C_5 (C) ${}^{31}C_6 - {}^{21}C_6$ (D) ${}^{30}C_5 + {}^{20}C_5$
- If $(1+x+x^2+x^3)^5 = a_0 + a_1x + a_2x^2 + \dots + a_{15}x^{15}$, then a_{10} equals to :
(A) 99 (B) 101 (C) 100 (D) 110
- Find the sum of the following infinite series : $\frac{1}{2}\left(\frac{1}{5}\right)^2 + \frac{2}{3}\left(\frac{1}{5}\right)^3 + \frac{3}{4}\left(\frac{1}{5}\right)^4 + \dots$
- 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
- 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