MATHEMATICS

DPP

DAILY PRACTICE PROBLEMS

DPP No. 61

Total Marks : 65

Max. Time : 62 min.

Topic : Binomial Theorem

Type of Questions		M.M., Min.
Single choice Objective (no negative marking) Q.4,5,6,7,13,15	(3 marks, 3 min.)	[18, 18]
Multiple choice objective (no negative marking) Q.14	(5 marks, 4 min.)	[5, 4]
Subjective Questions (no negative marking) Q.1,2,3,8,9,10,11,12	(4 marks, 5 min.)	[32, 40]

1. Find the index ' n ' of the binomial $\left(\frac{x}{5}+\frac{2}{5}\right)^n$ if the 9^{th} term of the expansion has numerically the greatest coefficient ($n \in N$).

2. If $\left(3\sqrt{3}+5\right)^n$ = p+ f, where p is an integer and f is a proper fraction, then find the value of $\left(3\sqrt{3}-5\right)^n$, $n \in N$.

3. Show that the integral part in $\left(6\sqrt{6}+14\right)^{2n+1}$ is even, $n \in N$.

4. Find numerically greatest term in the expansion of $(2 + 3x)^9$, when x = 3/2.

(A) ${}^9C_6 . 2^9 . (3/2)^{12}$ (B) ${}^9C_3 . 2^9 . (3/2)^6$ (C) ${}^9C_5 . 2^9 . (3/2)^{10}$ (D) ${}^9C_4 . 2^9 . (3/2)^8$

5. The numerically greatest term in the expansion of $(2x + 5y)^{34}$, when x = 3 & y = 2 is :

(A) T_{21} (B) T_{22} (C) T_{23} (D) T_{24}

6. The greatest integer less than or equal to $(\sqrt{2} + 1)^6$ is

(A) 196 (B) 197 (C) 198 (D) 199

7. Let $\left(5+2\sqrt{6}\right)^n$ = p + f, where $n \in N$ and $p \in N$ and 0 < f < 1, then the value of $f^2 - f + pf - p$ is:

(A) a natural number (B) a negative integer (C) a prime number (D) an irrational number

8. $\frac{C_1}{C_0} + 2\frac{C_2}{C_1} + 3\frac{C_3}{C_2} + \dots\dots + n\frac{C_n}{C_{n-1}} = \frac{n(n+1)}{2}$

9. $(C_0 + C_1)(C_1 + C_2)(C_2 + C_3)(C_3 + C_4) \dots\dots (C_{n-1} + C_n) = \frac{C_0\, C_1\, C_2 \dots\dots C_{n-1}\,(n+1)^n}{n!}$

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10. $C_o - 2C_1 + 3C_2 - 4C_3 + \dots + (-1)^n (n+1) C_n = 0$

11. $2.C_o + \frac{2^2.C_1}{2} + \frac{2^3.C_2}{3} + \frac{2^4.C_3}{4} + \dots\dots \frac{2^{n+1}.C_n}{n+1} = \frac{3^{n+1}-1}{n+1}$

12. Prove that ${}^{n}C_r + {}^{n-1}C_r + {}^{n-2}C_r + \ldots\ldots\ldots\ldots. + {}^{r}C_r = {}^{n+1}C_{r+1}$

13. The value of the expression $\left(\sum_{r=0}^{10} {}^{10}C_r\right)\left(\sum_{K=0}^{10} (-1)^K \frac{{}^{10}C_K}{2^K}\right)$ is :

(A) 2^{10} (B) 2^{20} (C) 1 (D) 2^5

14. The sum of the co–efficients in the expansion of $(1 - 2x + 5x^2)^n$ is a and the sum of the co–efficients in the expansion of $(1 + x)^{2n}$ is b. Then:

(A) a = b
(B) $(x - a)^2 + (x - b)^2 = 0$, has real roots
(C) $\sin^2 a + \cos^2 b = 1$
(D) ab = 1

15. $\frac{{}^{11}C_0}{1} + \frac{{}^{11}C_1}{2} + \frac{{}^{11}C_2}{3} + \ldots\ldots + \frac{{}^{11}C_{10}}{11} =$

(A) $\frac{2^{11}-1}{11}$ (B) $\frac{2^{11}-1}{6}$ (C) $\frac{3^{11}-1}{11}$ (D) $\frac{3^{11}-1}{6}$

Answers Key

1. n = 12

2. 1 – f, if n is even and f, if n is odd

4. (A)

5. (B)

6. (B)

7. (B)

13. (C)

14. (A)(B)(C)

15. (B)