

Assignment-1

AI24BTECH11019-PRATHEEK

C.MULTIPE CHOICE QUESTIONS

- 1) Given positive integers $r > 1, n > 2$ and that coefficient of $(3r)$ th terms in the binomial expansion of $(1 + x)^{2n}$ are equal. Then (1983 – 1Mark)
 - a) $n = 2r$
 - b) $n = 2r + 1$
 - c) $n = 3r$
 - d) none of these
- 2) The coefficient of x^4 in $\left(\frac{x}{2} - \frac{3}{x^2}\right)^{10}$ is (1983 – 1Mark))
 - a) $\frac{405}{256}$
 - b) $\frac{504}{259}$
 - c) $\frac{450}{263}$
 - d) none of these
- 3) The expression $\left(x + (x^3 - 1)^{\frac{1}{2}}\right)^5 + \left(x - (x^3 - 1)^{\frac{1}{2}}\right)^5$ is a polynomial of degree (1992 – 2Marks)
 - a) 5
 - b) 6
 - c) 7
 - d) 8
- 4) If in the expansion of $(1 + x)^m (1 - x)^n$, the coefficients of x and x^2 are 3 and -6 respectively, then m is (1999 – 2Marks)
 - a) 6
 - b) 9
 - c) 12
 - d) 24
- 5) For $2 \leq r \leq n$, ${}^nC_r + 2{}^nC_{r-1} + {}^nC_{r-2} =$ (2000S)
 - a) ${}^{n+1}C_{r-1}$
 - b) $2{}^{n+1}C_{r+1}$
 - c) $2^{n+2}C_r$
 - d) ${}^{n+2}C_r$
- 6) In the binomial expansion of $(a - b)^n, n \geq 5$, the sum of the 5^{th} and 6^{th} terms is zero. Then a/b equals (2001S)
 - a) $(n - 5) / 6$
 - b) $(n - 4) / 5$
 - c) $5 / (n - 4)$
 - d) $6 / (n - 5)$
- 7) The sum $\sum_{i=0}^9 {}^{10}C_i {}^{20}C_{m-i}$, (where ${}^pC_q = 0$ if $p < q$) is maximum when m is (2002S)
 - a) 5
 - b) 10
 - c) 15
 - d) 20
- 8) Coefficient of t^{24} in $(1 + t^{2^{12}})(1 + t^{12})(1 + t^{24})$ is (2003S)

- a) ${}^{12}C_6+3$
b) ${}^{12}C_6+1$

- c) ${}^{12}C_6$
d) ${}^{12}C_6+2$

9) If

$${}^{n-1}C_r = (k^2 - 3){}^nC_{r+1}$$

then $(k \in)$

(2004S)

- a) $(-8, -2]$
b) $[2, \infty)$

- c) $[-\sqrt{3}, \sqrt{3}]$
d) $(\sqrt{3}, 2]$

10) The value of ${}^{30}C_0 {}^{30}C_{10} - {}^{30}C_1 {}^{30}C_{11} + {}^{30}C_2 {}^{30}C_{12} \dots {}^{30}C_{20} {}^{30}C_{30}$ is where ${}^nC_r = {}^nC_r$ (2005S)

- a) ${}^{30}C_{10}$
b) ${}^{30}C_{15}$

- c) ${}^{60}C_{30}$
d) ${}^{31}C_{10}$

11) For $r = 0, 1, \dots, 10$, let A_r, B_r and C_r denote, respectively the coefficients of x^r in the expansions of $(1+x)^{10}, (1+x)^{20}$ and $(1+x)^{30}$. Then $\sum_{r=1}^{10} A_r (B_{10}B_r - C_{10}A_r)$ is equal to (2010)

- a) $B_{10} - C_{10}$
b) $A_{10} (B_{10}^2 C_{10} A_{10})$

- c) 0
d) $C_{10} - B_{10}$

12) Coefficient of x^{11} in the expansion of $(1+x^2)^4 (1+x^3)^7 (1+x^4)^{12}$ is (JEEAdv.2014)

- a) 1051
b) 1106

- c) 1113
d) 1120

D.MCQs WITH ONE OR MORE THAN ONE CORRECT

1) If c_r stands for nC_r , the the sum of the series $\frac{2(\frac{n}{2}!)(\frac{n}{2}!)}{n!} [C_0^2 - 2C_1^2 + 3C_2^2 - \dots + (-1)^n (n+1) C_n^2]$, where n is an even positive integer is equal to (1992 – 2Marks)

- a) 0
b) $(-1)^{\frac{n}{2}} (n+1)$
c) $(-1)^{\frac{n}{2}} (n+2)$

- d) $(-1)^n n$
e) none of these

2) If $a_n = \sum_{r=0}^n \frac{1}{{}^nC_r}$, then $\sum_{r=0}^n \frac{r}{{}^nC_r}$ equals (1998 – 2Marks)

- a) $(n-1)a_n$
b) na_n

- c) $\frac{1}{2}na_n$
d) None of The above