Assignment-1

AI24BTECH11019-PRATHEEK

C. Multiple 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
. $(1983 - 1 Mark)$

   (a) $n = 2r$ (c) $n = 3r$
   (b) $n = 2r + 1$ (d) none of these

2) The coefficient of x^4 in $\left(\frac{x}{2} - \frac{3}{x^2}\right)^{10}$ is
. $(1983 - 1 Mark))$

   (a) $\frac{405}{256}$ (c) $\frac{450}{263}$

   (b) $\frac{504}{259}$ (d) none of these

3) The expression $\left(x + \left(x^3 - 1\right)^{\frac{1}{2}}\right)^5 + \left(x - \left(x^3 - 1\right)^{\frac{1}{2}}\right)^5$ is a polynomial of degree
. $(1992 - 2 Marks)$

   (a) 5   (c) 7
   (b) 6   (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 $(1999 - 2 Marks)$

   (a) 6   (c) 12
   (b) 9   (d) 24

5) For $2 \leq r \leq n$, $\binom{n}{r} + 2\binom{n}{r-1} + \binom{n}{r-2} =$
. $(2000S)$

   (a) $\binom{n+1}{r-1}$ (c) $2\binom{n+2}{r}$

   (b) $2\binom{n+1}{r+1}$ (d) $\binom{n+2}{r}$

6) In the binomial expansion of $(a - b)^n, n \geq 5, t$ the sum of of the 5th and 6th terms is zero. Then a/b equals $(2001S)$

   (a) $(n - 5)/6$ (c) $5/(n - 4)$
   (b) $(n - 4)/5$ (d) $6/(n - 5)$

7) The sum $\sum_{i=0}^{9} \binom{10}{i}\binom{20}{m-i}$, (where $\binom{p}{q} = 0$ if $p < q$) is maximum when m is $(2002S)$

   (a) 5   (c) 15
   (b) 10   (d) 20

8) Coefficient of t^{24} in $\left(1 + t^{2^{12}}\right)\left(1 + t^{12}\right)\left(1 + t^{24}\right)$ is $(2003S)$

   (a) $^{12}C_6 + 3$ (c) $^{12}C_6$
   (b) $^{12}C_6 + 1$ (d) $^{12}C_6 + 2$

9) If $^{n-1}C_r = \left(k^2 - 3\right) {}^nC_{r+1}$ then $(k \in)$
. $(2004S)$

   (a) $(-8, -2]$ (c) $[-\sqrt{3}, \sqrt{3}]$
   (b) $[2, \infty)$ (d) $(\sqrt{3}, 2]$

10) The value of $\binom{30}{0}\binom{30}{10} - \binom{30}{1}\binom{30}{11} + \binom{30}{2}\binom{30}{12} \cdots \binom{30}{20}\binom{30}{30}$ is where $\binom{n}{r} = {}^nC_r$ $(2005S)$

   (a) $\binom{30}{10}$ (c) $\binom{60}{30}$

   (b) $\binom{30}{15}$ (d) $\binom{31}{10}$

11) For $r = 0, 1 \cdots, 10$, 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 $\sum_{r=1}^{10} A_r (B_{10} B_r - C10 A_r)$ is equal to (2010)

(a) $B_{10} - C_{10}$

(c) 0

(b) $A_{10} \left(B_{10}^2 C_{10} A_{10} \right)$

(d) $C_{10} - B_{10}$

12) Coefficient of x^{11} in the expansion of $\left(1 + x^2\right)^4 \left(1 + x^3\right)^7 \left(1 + x^4\right)^{12}$ is

.

(*JEEAdv*.2014)

(a) 1051

(c) 1113

(b) 1106

(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 $\frac{2\left(\frac{n}{2}!\right)\left(\frac{n}{2}!\right)}{n!}[C_0^2 - 2C_1^2 + 3C_2^2 - \cdots + (-1)^n (n+1) C_n^2]$, where n is an even positive integer is equal to

(1992 − 2*Marks*)

(a) 0

(d) $(-1)^n n$

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

(e) none of these

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

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

.

(1998 − 2*Marks*)

(a) $(n-1) a_n$

(c) $\frac{1}{2} n a_n$

(b) $n a_n$

(d) None of The above