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

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

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

6) In the binomial expansion of $(a-b)^n$,$n \geq 5, t$ the sum of 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 $\sum_{i=0}^{9} \binom{10}{i}\binom{20}{m-i}$,(where$\binom{p}{q} = 0$ if $p < q$)is maximum when m is $(2002S)$

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

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

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

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

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

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

    a) $\binom{30}{10}$
    b) $\binom{30}{15}$
    c) $\binom{60}{30}$
    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 $\sum_{r=1}^{10} A_r \left(B_{10}B_r - C10A_r\right)$ is equal to (2010)

    a) $B_{10} - C_{10}$
    b) $A_{10}\left(B_{10}^2 C_{10} A_{10}\right)$
    c) 0
    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
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 $\frac{2\left(\frac{n}{2}!\right)\left(\frac{n}{2}!\right)}{n!}\left[C_0^2 - 2C_1^2 + 3C_2^2 - \cdots + (-1)^n (n+1) C_n^2\right]$, where n is an even positive integer is equal to (1992 − 2$Marks$)

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 − 2$Marks$)

a) $(n-1) a_n$
b) na_n
c) $\frac{1}{2}na_n$
d) None of The above