Class: XI
[Permutation, Combination and Binomial Theorem]
Time: - 1 ½ hr FM: 50

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(Answer **ALL** questions)

Group- A $[2\times10=20]$

1 - a) : What is the total number of functions that can be defined from the set $\{1,2\}$ to $\{1,2,3\}$.

b) : In how many ways three people can stand in a circle?

c) : Write the number of divisors of 360.

d) : How many distinct even number can be formed by using the three digits $1,2,3$?

e) : If a^2x^5 occurs in a term in the expansion of $(a+x)^n$, then what is the value of n?

f) : What is the total number of terms in the expansion of $(1+x)^7(1-x)^7$?

g) : In how many ways can the letter of the word "SHOULD" be arranged so that the vowels always occupy only odd positions?

h) : What is the sum of all three digit numbers formed by using the digits $1,2,3$?

i) : What is the total number of diagonals of a given pentagon?

j): ${}^nC_4 = {}^nC_{11}$, then find $n=?$

Group- B $[5\times6=30]$

(2): Find the term independent of x in the expansion of $\left(2x+\frac{1}{3x^2}\right)^9$?

(3): How many 5 - digit odd numbers with distinct digits can be formed with the digits: $0,1,2,3,4$.

(4): Show that the middle term in the expansion of $(1+x)^{2n}$ is $\frac{1.3.5.....(2n-1)}{n!}.2^n.x^n$.

(5): There are 10 books in a shelf with different titles, five of these have red covers and others have green covers. In how many ways can these be arranged so that the red books are placed together?

(6): Find the term independent of x in the expansion of $\left(\frac{1}{2}-10x+6x^2\right)\left(\frac{1}{x}-x\right)^{10}$.

(7): In how many ways can a student choose five courses out of the courses $C_1, C_2, C_3 \ldots\ldots\ldots C_9$ if C_1, C_2 are compulsory and C_6, C_8 can not be taken together.