HSC 1ST YEAR	Π	MATHEMATICS		TOTAL:- 50
	Combinatorics	and Mathemat	ical Induction	
Choose the correct answer:-				10 x 1 = 10
The number of	five digit telephone n	umbers having	at least one of their	digits repeated is
(1) 90000	(2) 10000)	(3) 30240	(4) 69760.
There are 10 points two points is	nts in a plane and 4 of th	hem are collinea	r. The number of straig	ght lines joining any
(1) 45	(2) 40	(3)	39 (4	4) 38.
The number of another set of the	parallelograms that car ree parallel lines.	n be formed fro	m a set of four paral	lel lines intersecting
Number of side	es of a polygon havin	g 44 diagonals	is·····	
(1) 4	(2) 4!		(3) 11	(4) 22
The product of	first n odd natural nu	mbers equals		
(1) ${}^{2n}C_n \times {}^n$	P_n (2) $(\frac{1}{2})^n \times$	$^{2n}C_n \times ^n P_n$	$(3)(\frac{1}{4})^n \times {}^{2n}C_n \times {}^{2n}F$	$P_n (4)^n C_n \times^n P_n$
. In ${}^{2n}C_3 : {}^nC_3$	= 11:1 then <i>n</i> is	, , , , , , , , , , , , , , , , , , , ,		
(1) 5 If $nPr = 720$ m	(2) 6 $C_{\rm T}$ then the value of r	.ia	(3)11	(4)7
(1) 6	(2) 5	(3) 4	(4) 7	
How many dif	fferent arrangements of G	can be made or	at of letters of word	S
(1) 11!	$(2)\frac{11!}{(3!)^2(2!)^2}$	$(3)\frac{11!}{3!\cdot 2!}$	$(4)\frac{11!}{3!}$	
The number of 3, 4, 5, 6, 7, 8,	of 4 digit numbers, 0 and no digit is being	that can be for the second sec	ormed by the digit	S
(1) 720	(2) 840	(3) 280	(4) 560	
The number of octagon is	diagonals that can be	drawn by join	ing the vertices of a	1
(1) 28	(2) 48	(3) 20	(4) 24	
A polygon has	44 diagonals then the	number of its s	ides is	
(1) 11	(2) 7	(3) 8	(4) 12	
		GEOTION P		

ONE TWO ACADEMY UNIT TEST - 6

SECTION B

 $5 \ge 2 = 10$

Answer any 5 the following (Qno 11 is compulsory) :-

11) In a village, out of the total number of people, 80% of the people of the people own coconut groves and 65% of the people own paddy fields. What is the minimum percentage of people pwn both ?

12) What is the unit digit of the sum $2! + 3! + 4! + \dots + 22!$?

13) Find the number of arranging BANANA.

14) If nPr = 720, and nCr = 120 find n and r.

15)Out of 7 consonants and 4 vowels, how many strings of 3 consonants and 2 vowels can be formed ?

16)In how many ways 5boys and 4girls can be seated in a row so that no two girls are together.

SECTION C

Answer any 5 the following (Qno 19 is compulsory) :-

17)If 10Pr = 7P r+2 find r.

18)Find the rank of the word IITJEE.

19) How many different selections of 5 books can be made from 12 different books if,

a) Two particular books are always selected.

b) Two particular books are never selected.

20) Find the number of strings of 4 letters that can be formed with the letters pf the word EXAMINATION ?

21)Prove that $2nCn = \frac{2^n \ 1 \ x \ 2 \ x \ 3..... \ (2n-1)}{n!}$.

22)There are 10 bulbs in a room.Each one of them can be operated independently. Find the number of ways in which thr room can be illuminated.

SECTION D

Answer the following:-

 $3 \ge 5 = 15$

23)Find the sum of all 4 digit numbers that can be formed using the digits 1, 2, 4, 6, 8.

Or

Prove that nCr + nCr - 1 = n+1 Cr and hence deduce the value of $15C3 + 2x \ 15C4 = 15C5 = 17C5$. 24) Prove that $\frac{1}{1+2} + \frac{1}{1+2+3} + \frac{1}{1+2+3+4} \dots \frac{1}{1+2+3+4+\dots n} = \frac{n-1}{n+1}$. Or

An exam paper contains 8 questions, 4 in Party A and 4 in Part B. Examiners are required to answer 5 questions. In how many ways can this be done if

a)There are no restrictions of choosing the number of question papers in either parts.

b)Atleast two questions from Part A must be answered.

25)Prove that for any natural number n, $a^n - b^n$ is divisible by a-b, where a>b.

Or

Find the number of strings of 5 letters can be formed with the letters of the word PROPOSITION.

$5 \ge 2 = 10$