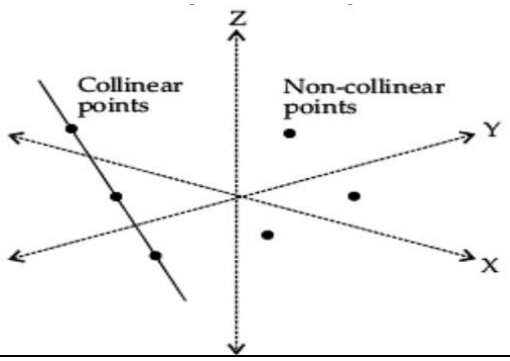
CHAPTER-7

PERMUTATIONS & COMBINATIONS

02 MARK TYPE QUESTIONS

Q. NO	QUESTION	MARK
1.	There are 12 points in a plane of which 5 are collinear. How many straight lines can be drawn using all the points?  	2
2.	Two friends Ajay and Ravi are playing cards. Ajay asks Ravi to choose any four cards from a pack of 52. (i) In how many ways Ravi can select all 4 cards from same suit. (ii) In how many ways Ravi can select all 4 cards from different suit. 	2
3.	Rashmita is playing with scrambles word cubes. She needs to form a word using all the letters of the word 'ORGANIC' without repetition of the letters. (i) In how many ways vowels and consonants alternate between each other? (ii) In how many words the all vowels are together?	2
4.	While opening the Number lock of Home, which is 5-digit number. Mohan forget the Password of Lock but he remember that password began with digit 6, now he think that how many ways he open the lock as rest 4-digits of password are distinct.	2

5.	In a office party there are 8 person making a shakes hands with one another how many ways does 8 persons shakes hands?	2
6.	Find the sum of the digits in the unit place of all the numbers formed with the help of 2,3,4,5 taken all at a time.	2
7.	Find the number of way in which a team of eleven players can be selected from 22 players always including 2 of them and excecluding 3 of them.	2
8.	Find the number of words which can be formed out of the letters of the word ARTICLE, so that vowels occupy the even place.	2
9.	A customer forget a five digit code for me ATM in a bank. However he remembers that this code consists of digits 1,2,3,4,5. Find the least possible number of trails necessary to obtain the correct code.	2
10.	Mathematics question paper of SEE has two parts. Part A contains 10 questions and part B contains 12 questions. If a student has to answer 8 from part A and 10 from part B, In how many ways can he choose the question?	2
11.	Eight chairs are numbered 1 to 8. Two women and 3 men wish to occupy one chair each. First the women choose the chairs from amongst the chairs 1 to 4 and then men select from the remaining chairs. Find the total number of possible arrangements.	2
12.	How many automobile license plates can be made if each plate contains two different letters followed by three different digits?	2
13.	If 20 lines are drawn in a plane such that no two of them are parallel and no three are concurrent, in how many points will they intersect each other?	2
14.	A convex polygon has 44 diagonals. Find the number of its sides.	2
15.	Find the number of different four digit numbers that can be formed with the digits 2, 3, 4, 7 and using each digit only once.	2
16.	In an examination, a student has to answer 4 questions out of 5 questions; questions 1 and 2 are however compulsory. Determine the number of ways in which the student can make the choice.	2
17.	In a certain city, all telephone numbers have six digits, the first two digits always being 24 or 25 or 26 or 28 or 29. How many telephone numbers have all six distinct digits	2
18.	Everybody in a room shakes hands with everybody else. The total number of handshakes is 66. Then find total number of persons in the room.	2
19.	Find the number of words which can be formed out of the letters of the word ARTICLE, so that vowels occupy the even place.	2

20.	How many triangle can be draw in regular octagon. Also find all diagonals.	2

ANSWERS:

Q. NO	ANSWER	MARKS
1.	The numbers of lines formed is ${}^{12}_{2}C - {}^{5}_{2}C + 1$=66-10+7=57	2
2.	(i) The numbers of ways Ravi can select all 4 cards from same suit is ${}^{13}_{4}C + {}^{13}_{4}C + {}^{13}_{4}C + {}^{13}_{4}C$ = $4.{}^{13}_{4}C$ = 2860 (ii) The numbers of ways Ravi can select all 4 cards from different suit is ${}^{13}_{1}C$ x ${}^{13}_{1}C$ x ${}^{13}_{1}C\,{}^{13}_{1}C$ = 13^4 = 28561	2
3.	(i) Number of words =4! X 3! = 144 (ii) Vowels – O A I O A I, R,G, N, C- Places No of ways to arrange = 5! O A I , Ways to arrange = 3! No of words beginning with Vowels = 5! x 3! = 120 x 6 = 720	2
4.	As 5-digit number lock is starts with digit 6, so rest 4 digit is filled with digits 0,1,2,3,4,5,7,8,9 Number of ways of opening lock is ${}^{9}_{4}P$ ways = 9 x 8 x 7 x 6 = 3024 ways	2
5.	Number of shakes hands = ${}^{8}_{2}C$ = 28 ways	2
6.	If the unit place us “2” remaining 3 place can be filled in 3! ways So sum of the unit digits =3!(2+3+4+5) = 6x14= 84	2
7.	Total number of players =22 We have to selected 11 players We have to exclude 3, so 19 players are available. Also from these 2 particular players are always included .Therefore to select 9 players from remaining 17 players in $17c_9$ ways	2
8.	Vowels are A,I,E and consonants are R,T,C,L. Now vowels occupy three even b places (2^{nd}, 4^{th} and 6^{th}) in ways. In remaining four places four consonants can be arranged in 4! was so, total number of words = 3! X 4! = 6 X 24 = 144	2
9.	No. of digits = 5 No. of vacant place = 5 No. of possible trials = $5p_5$=120	2
10.	No. of ways 8 questions choosen from part A = 10 c_8. No. of ways 10 question be choosen from part B = 12 c_{10} Required number of ways = 10 c_8 X 12 c_{10} = 2970	2
11.	Two women can be arranged in 4 chairs in ${}^4P_2$ ways. In remaining 6 chairs, 3 men can be arranged in ${}^6P_3$ ways. Total number of possible arrangements=${}^4P_2 \times {}^6P_3$ =1440	2
12.	Arrangement of 26 letters,taken 2 at a time=${}^{26}P_2$=650 Arrangement of 10 digits,taken 3 at a time=${}^{10}P_3$=720. Total number of license plates=650×720=468000.	2
13.	It is given that no two lines are parallel which means that all lines are intersecting and no three lines are concurrent.	2

	One point of intersection is created by two straight lines. Number of points of intersection=Number of combinations of 20 straight lines taken two at a time $={}^{20}C_2=190$	
14.	Let the number of sides the given polygon have = n We have number of diagonals of the polygon = ${}^{n}C_2 - n$. ${}^{n}C_2 - n=44$ n(n-1)-2n=88 n=11	2
15.	Required number of ways$={}^{4}P_4=24$	2
16.	(a) Out of 5 questions 2 are compulsory So Number of ways he makes choice $=3_{C_2}=3$	2
17.	Let first two digit be 24 Remaining 4dgits are chosen from 0,1,3,5,6,7,8,9 Remaining 4digits can be chosen in 8_{P_4} ways Numbers of such telephone number =8x7x6x5 =1680 Now first two digits(24 or 25 or 26 or 28 or 29) Total number of telephone number = 5x1680 =8400	2
18.	Let total no of hands =n So $n_{C_2}= 66$ n(n-1) =132 =12x 11 n = 12	2
19.	Number of vowels and other alphabets are 3 and 4 respectively Number of ways even places can be filled up by vowels =3x2x1 =6 Number of ways odd places can be filled up =4x3x2x1 =24 Total number of ways word can be formed =6x24 = 144	2
20.	Number of triangle can drawn in octagon $=8_{C_3}=\frac{8!}{3!5!}=\frac{8x7x6}{3x2}=56$ Total no of diagonal = total no of lines – no of sides of octagon $=8_{C_2}- 8 =\frac{8X7}{2} - 8 = 28 – 8 =20$	2