



Q.60)	Find the number of ways in which six '+' and four '-' signs can be arranged in a line such that no 2 signs '-' occur together?											
Sol.60)	<p>'+' = 6 , '-' = 4</p> $\frac{1}{1} + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{6} + \frac{1}{7}$ <p>There are seven places available for four '-' signs, which they can be arranged in = $\frac{{}^7P_4}{4!}$ ways (since, all '-' signs are similarly)</p> <p>Five '+' signs can mutually arranged in = $\frac{5!}{5!} = 1$ way</p> <p>Required no. of ways = $\frac{{}^7P_4}{4!} \times 1$</p> $= \frac{7!}{3!4!} = \frac{7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1}{3 \times 2 \times 1 \times 4 \times 3 \times 2 \times 1}$											
Q.61)	Find the number of ways in which we can choose committee from four men & six women so that the committee includes at least two men and exactly twice as many women as men?											
Sol.61)	<p>94</p> <p>Hint:</p> <table><tr><td>(4)</td><td>(6)</td></tr><tr><td>M</td><td>W</td></tr><tr><td>2</td><td>4</td></tr><tr><td>3</td><td>6</td></tr><tr><td>4</td><td>8</td></tr></table>	(4)	(6)	M	W	2	4	3	6	4	8	
(4)	(6)											
M	W											
2	4											
3	6											
4	8											
Q.62)	Ten different letters of alphabet are given words with five letters are formed from these given letters. Then find the number of words which have at least one letter repeated?											
Sol.62)	<ol style="list-style-type: none">No. of 5 letters words from 10 letters (without any condition) = $10 \times 10 \times 10 \times 10 \times 10 = 10^5$No. of 5 letters words from 10 letters in which 'no' letter will be repeated = $10 \times 9 \times 8 \times 7 \times 6$Required no. of words in which at least 1 letter will be repeated (since, at least one = total – none) $= 10^5 - 10 \times 9 \times 8 \times 7 \times 6 = 697660 \text{ ans.}$											
Q.63)	There are 10 lamps in a hall. Each one of them can be switched on independently. Find the number of ways in which the hall can be illuminated?											
Sol.63)	<p>Each lamp can be switched on and off in 2 ways</p> <p>\therefore for ten lamps, no. of ways</p> $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 2^{10}$ <p>Out of these 2^{10} ways, there is one way in which all lamps get switched off</p> <p>Required no. of ways to illuminate the hall</p> $= 2^{10} - 1$ $= 1024 - 1 = 1023 \text{ ans.}$											
Q.64)	A five digit number divisible by 3 is to be formed using the numbers 0,1,2,3,4,5 without repetitions. Find total no. of ways this can be done?											
Sol.64)	<p>We know that no. is divisible by 3, if sum of all digits divisible by 3</p> <p>There are two cases:</p> <p>Case:1) 5 digit numbers can be formed using the digits 0,1,2,3,4,5</p> <table><tr><td>4</td><td>4</td><td>3</td><td>2</td><td>1</td></tr></table> $= 4 \times 4 \times 3 \times 2 \times 1 = 96$ <p>Case:2) 5 digit numbers can be formed using the digit 1,2,3,4,5</p> <table><tr><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr></table> $= 5 \times 4 \times 3 \times 2 \times 1 = 120$	4	4	3	2	1	5	4	3	2	1	
4	4	3	2	1								
5	4	3	2	1								



	Since, sum of digits in these cases is divisible by 3 ∴ required no. of ways = $120 + 96 = 216$ ans.	
Q.65)	The number 5-digit telephone number having at least one of their digit is repeated?	
Sol.65)	$90,000 - (9 \times 9 \times 8 \times 7 \times 6) = 30,240$ ans.	
Q.66)	In a football championship, 153 matches were played. Every 2 teams played one match with each other. The number of teams participating in the championship?	
Sol.66)	18 HINT : $n_{c_2} = 153$, find n	
Q.67)	A lady gives a dinner party for 6 guests. Find the number of ways in which they may be selected from among 10 friends if 2 of the friend will not attend the party together?	
Sol.67)	140 HINT: not together = total – together $= 10_{c_6} - 2_{c_2} \times 8_{c_4}$	
Q.68)	We wish to select 6 persons from 8, but if the person A is chosen then B must be chosen. In how many ways can the selection be made?	
Sol.68)	22 HINT: Case:1) A is chosen = 6_{c_4} , case:2) A is not chosen = 7_{c_6}	
Q.69)	Find the maximum number of points of intersection of 8 straight lines in a plane?	
Sol.69)		28 Hint: 8_{c_2}
Q.70)	In how many ways can the letters of the word PERMUTATIONS be arranged, if there are always 4 letters between P and S?	
Sol.70)		25401600