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Q.71)	For the post of the 5 teachers, there are 23 applicants. 2 posts are reserved for SC candidates & there are 7 SC candidates among the applicant. In how many ways can the selection be made?	
Sol.71)		11760 Hint: 7_{c_2}x 16_{c_3}
Q.72)	In a plane there are 37 straight lines of which 13 pass through the point A and 11 pass through the point B. no three lines pass through one point, no line passes through both points A and B and no 2 lines are parallel. Find the no. of points of intersection of the straight lines?	
Sol.72)	1. Total no. of points of intersection of 37 lines = $37c_2$ 2. 13 lines passes through the same point A, ∴ instead of $13c_2$points we get only one point i.e. A 3. Also 11 lines passes through the same point B, ∴ instead of $11c_2$points we get only one point i.e. B 4. ∴ required number of points of intersections = $37c_2 - 13c_2\ 11c_2 + 2$ = 666-78-55+2 = 535 ans.	
Q.73)	Show that n_{c_r}+ $n_{c_{r-1}}$= $n_{c_{r+1}}$	
Sol.73)	L.H.S = n_{c_r}+ $n_{c_{r-1}}$ = $\frac{n!}{r!(n-r)!} + \frac{n!}{(r-1)!(n-r+1)!}$ = n!$\left[\frac{1}{r!(n-r)!} + \frac{1}{(r-1)!(n-r+1)!}\right]$ = n!$\left[\frac{1}{r(r-1)!(n-r)!} + \frac{1}{(r-1)!(n-r+1)(n-r)!}\right]$ = n!$\left[\frac{n-r+1+r}{r(r-1)!(n-r)(n-r+1)!}\right]$ = $\frac{n!(n+1)}{r!(n-r+1)!}$ = $\frac{(n+1)!}{r!(n-r+1)!}$ = $^{n+1}c_r$ proved.	
Q.74)	Find the no. of permutations of n distinct things taken r together in which 3 particular things must occur together?	
Sol.74)	1. Consider 3 particular things as 1 2. Now, we have to select (r-3) things from (n-3) things which can be selected in $^{n-3}c_{r-3}$ ways 3. Now, we have arrange (r-3)+1 things i.e. (r-2) which can be arranged in (r-2)! Ways 4. Three particular things can mutually arranged in 3! Ways 5. Required no. of arrangements = $^{n-3}c_{r-3}$ x (r-2)! X 3! Ans.	
Q.75)	Given 11 points, of which 5 lie on one circle, other than these 5, no lie on one circle. Then the no. of circles that can be drawn so that each contains at least 3 of the given points? Figure: 2	
Sol.75)	1. No. of circles contains three points from remaining 6 points = $6c_3$ = $\frac{6x5x4}{6}$ = 20 2. No. of circles containing 3 points (1 from 1 to 5 and 2 from 6 to 11) = $5c_1$ x $6c_2$ = 5 x 15 = 75 3. No. Of circle containing 3 points (2 from 1 to 5 and 1 from 6 to 11) = $5c_2$ x $6c_1$ = 10 x 6 = 60 4. No. of circle containing 5 points (1 to 5) = 1 ∴ total no. of circles = 20 + 75 + 60 + 1 = 156 ans.	
Q.76)	Find the total no. of ways in which 'n' distinct objects can be put into 2 different	

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	boxes so that no box remains empty?	
Sol.76)	1. Each object can be put either in box1 or box2 2. There are two choices for each object 3. For 'n' objects no. of choices/ways = 2x2x2….n times = 2^n 4. Out of these ways, there are 2 ways in which either box1 or box2 remains empty 5. Total no. of ways = 2^n - 2 ans.	
Q.77)	If a denotes the no. of permutations of (x+2) things taken all at a time, b is the no. of permutations of x things taken 11 at a time and c the number of permutations of (x-11) things taken all at a time such that a = 182bc. Find the value of x?	
Sol.77)		X=12
Q.78)	Write the no. of ways in which 5 boys & 3 girls be seated in a row so that each girl is between 2 boys?	
Sol.78)		2880
Q.79)	If p$(2n-1,n)$+ p$(2n+1,n-1)$ = 227. Find the value of n?	
Sol.79)		N=10
Q.80)	Determine the no. of natural numbers smaller than 10^4, in the decimal rotation of which all the digits are distinct?	
Sol.80)		5274

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Q.81)	'm' men & 'n' women are seated in a row so that no two women sit together. If m>n then show that number of ways in which they can be seated as $\frac{m!(m+1)!}{(m-n+1)!}$	
Sol.81)		
Q.82)	The no. of different ways in which 8 persons can stand in a row so that between 2 particular persons A and B there are always 2 persons is (a) 60 x 5! , (b) 15 x 4! x 5! , (c) 4! X 5! , (d) none?	
Sol.82)		(a)
Q.83)	Show that ${}^{2n}c_n = 2^n \frac{(1,2,3.....(2n-1))}{n!}$	
Sol.83)		
Q.84)	In how many ways can 21 identical books on English & 19 identical books on 'Hindi' be placed in a row on a shelf so that two Hindi books may not be together?	
Sol.84)	${}^{1x22}c_{19}$ x 1 = 1540 ans.	