Exercise 1:					
1	A_4^3	2	A_6^3	3	impossible
4	Same color: 3 green or 3 blue: $A_4^3 + A_6^3$				
5	Different=total-same: $A_{12}^3 - (A_4^3 + A_6^3)$				
6	Different=total-same: $A_{12}^3 - (A_4^3 + A_6^3)$				
7	Total-(same+3different colors) = $A_{12}^3 - (\, A_4^3 + A_6^3 + A_4^1 \times A_6^1 \times A_2^1 \times 3!)$				
8	(2G and 1$\bar{G}$): $A_4^2 \times A_8^1 \times \frac{3!}{2!}$	9	(1R and 2$\bar{R}$) $A_2^1 \times A_{10}^2 \times \frac{3!}{2!}$	10	(3$\bar{G}$): A_8^3
11	At least one green: (1G and 2$\bar{G}$) or (2G and 1$\bar{G}$) or (2G) 2nd method: Total – no green = $A_{12}^3 - A_8^3$				
12	At least two blue: (2B and 1$\bar{B}$) or (3B): $A_6^2 \times A_6^1 \times \frac{3!}{2!} + A_6^3$				
13	At most two green: (2G and 1$\bar{G}$) or (1G and 2$\bar{G}$) or(3$\bar{G}$) 2nd method : Total – 3G = $A_{12}^3 - A_4^3$				
14	At most three red: (2R and 1$\bar{R}$) or (1R and 2$\bar{R}$) or (no red) = total = A_{12}^3				
15	(first red; second blue; third green) : $A_2^1 \times A_6^1 \times A_4^1$				
16	(Red; blue; green): $A_2^1 \times A_6^1 \times A_4^1 \times 3!$				
17	(First green; second green; third blue): $A_4^2 \times A_6^1 \times \frac{3!}{2!}$				
18	(third red; 2 others) : $A_2^1 \times A_{11}^2$	19	(Third red; 2$\bar{R}$) : $A_2^1 \times A_{10}^2$		
20	(2nd not blue, 2 others) $A_6^1 \times A_{11}^2$	21	($first\ B$;2 others) $A_6^1 \times A_{11}^2$		
22	($first\ B$;2$\bar{B}$) $A_6^1 \times A_6^2$	23	(First 2 G;1$\bar{G}$): $A_4^2 \times A_8^1$		
24	(first G; third R…) : $A_4^1 \times A_2^1 \times A_{10}^1$	25	(R; R; $\bar{R}$) : $A_2^2 \times A_{10}^1$		
26	(First 3; second 2; third 6): $A_2^1 \times A_3^1 \times A_1^1$				
27	(Two odd numbers; one even) : $A_6^2 \times A_6^1$ (6 balls odd and 6 balls even)				
28	(two numbered 1; one not 1) $A_3^2 \times A_9^1 \times \frac{3!}{2!}$	29	(G_0 ; 2 others) $A_1^1 \times A_{11}^2 \times \frac{3!}{2!}$		
30	(G_0; 1;2) or (1;1;1) : $A_1^1 \times A_3^1 \times A_3^1 \times 3! + A_3^3$	31	(B_4; B_5; B_6) : A_3^3		
32	Sum greater than 15 : impossible				
33	Blue and even: (B_4; B_2; B_6): $A_1^1 \times A_1^1 \times A_1^1 \times 3!$				
34	Blue only or even only: $A_6^3 + A_6^3$				
35	Neither even and blue: A_3^3 from R_1, G_1 or G_3				
36	Even or odd: even only + odd only – (even and odd) : $A_6^3 + A_6^3 - 0$				

Exercise 3:					
1	C_6^4	2	C_4^4	3	impossible
4	Same color: 4 red or 4 white or 3 blue: $C_6^4 + C_5^4 + C_4^4$				
5	Total – (same color) = $C_{18}^4 - (C_6^4 + C_5^4 + C_4^4)$				
6	Total – (same color) = $C_{18}^4 - (C_6^4 + C_5^4 + C_4^4)$				
7	(2R;1W;1B) or (2R;1W;1Y) or (2R;1W;1Y) or (2W;1R;1B) or (2W;1R;1Y) or (2W;1B;1Y) or (2B;1R;1W) or (2B;1R;1Y) or (2B;1W;1Y) or (2Y;1R;1B) or (2Y;1R;1Y) or (2Y;1B;1Y)				
8	(2Y; $2\bar{Y}$) ; $C_3^2 \times C_{15}^2$	9	$(1R; 3\bar{R})$: $C_6^1 \times C_{12}^3$	10	$(4\bar{Y})$: C_{15}^4
11	At least one yellow : (1Y and $3\bar{Y}$) or (2Y;$2\bar{Y}$)or (3Y) : ……. 2nd method : Total-no yellow : $C_{18}^4 - C_{15}^4$				
12	At least two blue : (2B and $2\bar{B}$) or (3B and $1\bar{B}$) or (4B) :……				
13	At most two white: (2W and $2\bar{W}$) or(1W and $3\bar{W}$) or(no white=$4\bar{W}$):….				
14	At most four red : (4R) or(3R and $1\bar{R}$) or (2R and $2\bar{R}$) or (1R and $3\bar{R}$) or $(4\bar{R})$ = total				
15	Four red : C_6^4				

Exercise 4:					
Part A					
1	C_{17}^3	2	$C_{17}^2 \times C_{13}^1$	3	$C_{14}^2 \times C_8^1$
4	Golden necklace; platinum watch; golden bracelet: $C_3^1 \times C_2^1 \times C_8^1$				
5	At least one golden: (1G;$2\bar{G}$) or (2G;$1\bar{G}$) or (3G) or total – (no golden) = $C_{30}^3 - C_{13}^3$				
6	At most two platinum: total – (3 platinum) =$C_{30}^3 - C_{13}^3$				
7	(Golden necklace only : 2 others) $C_3^1 \times C_{27}^2$				
Part B					
1	(2 Bracelet and one necklace) : $A_{14}^2 \times A_8^1$				
2	(Golden necklace and 2 platinum bracelet) : $A_3^1 \times A_6^2 \times \frac{3!}{2!}$				
3	(Golden necklace and platinum watch and golden bracelet) : $A_3^1 \times A_2^1 \times A_8^1 \times 3!$				
4	(no golden) = (3 platinum) = A_{13}^3				
5	At least one golden = total – (no golden) = $A_{30}^3 - A_{13}^3$				
6	At most three golden = (0G;$3\bar{G}$) or (1G;$2\bar{G}$) or (2G;$1\bar{G}$) or (3G;$0\bar{G}$) = Total				
7	(Golden necklace only : 2 others) : $A_3^1 \times A_{27}^2 \times \frac{3!}{2!}$				