Answers

1. 4P4 = 4 rankings
2. 5P3 = 60
3. $\frac{14!}{2!3!4!}$=302702400
4. $12P7$ = 3991680
5. $26P10 = 1.9275 \times 10^{13}$ ways
6. $3 + 2 + 4 = 9$
7.
   a. 12C5 =1287
   b. 5C1 x 3C1 x 3C1 x 2C1 = 90
   c. 5C2 x 3C2 x 3C1 = 90
   d. 5 x 3 x 3 x 2 + (5 x 3 x 3C2) =135
8.
   a. (5-1)! = 24
   b. 2! x (4-1)! = 12
   c. (3-1)! = 2
   d. 5P3 = 60
9.
   a. 17C12 = 6188
   b. (3C3 x 4C2 x 4C2) + (3C3 x 4C3 x 4C1) = 52
10.
    a. 10C6 x 12C6 = 194040
    b. 12C12 + (12C11 + 10C1) + (12C10 x 10C2) + (12C9 x 10C3) + (12C8 x 12C4) + (12C7 x 10C5) = 333025
11. N = 5(4-1)+1 =16
12. N = 101(2-1)+1 =102
13. N = 5(6-1)+1 = 26
14. Let computers be 1,2,3,4,5,6. Let a be number of computers connected to a certain computer r is connected. We cannot have a case where $a_r = 0$ and a_t for some other computer t is 5. Therefore, the connections for a_r may only be {0,1,2….4} or {1,2,3,4,5}. In this case, number of computer > a, so there exists at least 2 computers with the same number of connections.
15.
    a. N = 2(3-1)+1 =5
    b. 13 balls.