

ONS.

ed 1, 2 . . . 6.

?  
g be done in  
s were to be

in single file,  
e arranged?

nts in the last  
s must be to-

letters in any  
tters could be

formed were  
of a set should  
ould there be,

in a row. In  
the condition

problem in case

the words *you*  
will all three  
may be recog.  
her letters fol-

etters made a  
0 letters?

will the first  
n their second

permutations  
ll be the sum  
s.  $\frac{1}{2}(n+1)!$

13. What will be the sum of each column if the possible permutations of the figures 1 2 2 3 3 3 4 are all written under each other?

14. From a collection of 5 capital letters and 7 small ones how many combinations of 1 capital with 2 small ones can be formed?

15. The driver of a four-horse coach can choose his horses from a stable of 6 white and 8 black horses, but he must not pair 2 horses of different colors. In how many different ways may he choose his 4 horses?

16. How many of the possible combinations of 3 letters in the first 10 will contain the letter *c*? How many will contain both the letters *c* and *d*?

17. Of the possible combinations of *s* things in *n*, how many will contain a designated thing? How many 2 designated things? How many *k* designated things?

18. A party of 6 meet for whist, 2 waiting while the other 4 play. Each 4 must play one game with each possible arrangement of partners. How many games will be played in all; how many will each person play, and how many times will any two designated persons have met as partners?

19. From a collection of 5 letters and 6 numbers how many combinations, each consisting of 1 letter and 2 numbers, can be formed? How many consisting of 2 letters and 3 numbers? Of 5 letters and 4 numbers?

20. From a collection of *m* letters and *n* numbers how many combinations of *r* letters with *s* numbers can be formed?

21. In how many ways may a pile of 20 balls be divided into two piles, the one having 15 balls and the other 5?

22. How many different signals may be made with 4 flags of different colors, it being assumed that each different order of each combination forms a different signal, but that the signal remains the same when the order is reversed?

23. What would be the answer to the preceding problem if each combination of several flags could be arranged either horizontally or vertically, and an inversion of each vertical arrangement made a different signal?