Use generating functions or exponential generating functions to solve the following problems:

1. Find the number of ways to select 10 balls from a collection of 6 red, 10 orange, and 10 green balls if an even number of green balls must be selected.

2. Find the number of ways to place 20 quarters in 6 boxes, so that the first box contains between 1 and 5 quarters and each of the other boxes contain at least 2 quarters.

3. Find the number of ways to select 50 marbles from a bag containing 50 red, 43 blue, 29 white, and 24 green marbles if an even number of red marbles and an odd number of blue marbles must be selected.

4. If \( a_n \) is the number of integral solutions of \( 2x + y + z = n \) with \( x, y \geq 0 \) and \( z \geq 1 \), find a formula for \( a_n \).

5. Find the number of sequences of \( n \) digits, each of which is either 1, 2, 3, or 4, such that 1, 2, and 3 each occur an odd number of times.

6. Determine the number of \( n \)-digit sequences for which each digit is in \( \{1, 3, 5\} \) and 1 and 2 each occurs an even number of times and 5 occurs at least once.