1. **How many integer solutions are there to the equation**
$$A + B + C + D = 17$$
$$A, B, C, D > 0$$

2. Suppose there are 20 bags, each containing a $5 coin and a $7 coin. If we can use at most one coin from each bag, in how many different ways can we pay $17, assuming that all coins are distinguishable (i.e. the $5 coin from the first bag is considered to be different from that in the second bag, and so on). Formulate the problem using a generating function.