

**Mathematics 150 Assignment 11 – F. Goodman**  
**December, 2007**

Use exponential generating function models to solve the following exercises:

1. Find the exponential generating function for the number of arrangements (permutations) of  $r$  objects of 5 different types, with at most 5 of each type.
2. Find the exponential generating function for the number of ways to distribute  $r$  people into six different rooms with between two and four people in each room. (Explain why this is the same as a permutation/arrangement problem.)
3. Find the number of ways to deal a sequence of 13 cards from a standard 52 card deck, if the suits of the cards are ignored and only the values of the cards are noted. (The order in which the cards are dealt matters.)
4. Find the number of  $r$ -digit sequences, with digits 0, 1, 2, 3, such that the number of 0s is even and the number of 1s is odd. The answer is  $4^{r-1}$ .