Name: _____

1. This problem concerns the parking space model, pp.66ff. Let O_i denote the number of open spaces in the ith block.

(a) (10) Find $p_D(0)$.

(b) (10) Give a loop-free R expression for $P(N <= 5)$, using one or more of the functions on p.66.

(c) (10) Give a loop-free R expression for $P_{O_2}(3)$.

(d) (15) Give a loop-free R expression vor $Var(O_1 - O_2)$.

(e) (10) Give a loop-free R expression vor $Var(|O_1 - O_2|)$.

(f) (15) Give a loop-free R statement to place between lines 5 and 6 in the code on p.67 that will print the approximate value of $E(1/(1 + D^2))$.

2. (15) Give a single, loop-free R statement to replace lines 9-10 in the ALOHA network model on p.57, making use of one of the functions introduced in Chapter 3. Think of the notebook!

3. (15) In the bus ridership model, first introduced in Sec. 2.11, find $P(L_3 = 5 | L_2 = 8$ and $B_3 = 1)$.

Solutions:

1a. $p_D(0) = P(D = 0) = P(N = 11) = (1 - 0.15)^{10}0.15$

1b. pgeom(5,0.15)

1c. dbinom(3,10,0.5

1d. $Var(O_1 - O_2) = Var(O_1) + Var(O_2) = 2 \cdot 10 \cdot 0.15(1 - 0.15)$

1e. Same as (d); see definition of Var().

1f. mean(1/(1+dvals^2))

2. rbinom(1,2,p)

3. dbinom(4,8,0.2)