Directions: **Work only on this sheet** (on both sides, if needed); do not turn in any supplementary sheets of paper. There is actually plenty of room for your answers, as long as you organize yourself BEFORE starting writing.

1. (20) On p.105, it says, "Since the simulated time variable **Simulation._t** is in a separate module..." Suppose we've installed SimPy in **/a/b/c/**. What will be the full path name of the module referred to here?

2. (20) What kind of object is requred for the second argument to SimPy's **activate()** function? Your answer must be a single Python term.

3. This problem concerns the first example in our Oct. 24 handout titled **3des.pdf**.

(a) (20) The difference computed in line 39 is equal to the value of an expression computed in another line. State the number of the latter.

(b) (20) Say we're interested in the mean idle period per machine. (Note that due to the symmetry of the situation, this will be the same for all machines.) Add code to compute this and print it out. Write your answer in the form, "Between lines 40 and 41, insert this line..."

4. (20) Consider the cell phone model in the handout in Problem 3. Suppose that 5% of all the calls made by those in cars passing through the cell ends before the car gets all the way through the cell. Among such calls, let Y denote the proportion of the trip through the cell during which the call is still active. For instance, Y = 0.88 means the call end when the car was 88% through the cell. Assume Y is uniformly distributed on (0,1), which by the way can be simulated by calling **uniform(0,1)** in Python's **random** library. Show how to alter the code to reflect this variation on the original model. As in Problem 3, express your answer in terms of what code you insert where, and in this case, also state the lines to be deleted, if any.

Solutions:

1. /a/b/c/SimPy/Simulation.py

2. *iterator*

3.a 36

3.b

between 21 and 22:

TotIdle = 0.0 NIdle = 0

between 27 and 28:

StartIdle = now() MachineClass.NIdle += 1

between 28 and 29:

MachineClass.TotIdle += now() - StartIdle

between 73 and 74:

print MachineClass.TotIdle / MachineClass.NIdle

4.

between 157 and 158:

```
if Globals.Rnd.uniform(0,1) < 0.1:
    self.Dur *= Globals.Rnd.uniform(0,1)
```