[6 points] Consider the following system. Customers arrive from the outside world (with an interarrival time of 15 minutes, exponentially distributed) to the stairmaster in an exercise room. Only one person can be using the treadmill at a time. Once a customer finishes with the treadmill, they proceed to stationary bike. The stationary bike is a two-seater. When a customer finishes with the bike, they leave and go home. No loitering is allowed in the exercise room. That is, if someone arrives to a piece of equipment and they can't begin using the equipment immediately, they must leave the room and go home. Once someone starts exercising on a piece of equipment, they use it for an average of 20 minutes (exponentially distributed).

- Draw an appropriate high level queuing network model and the appropriate underlying Markov diagram. Label all arcs.
- Give the appropriate Kendall notation for each of the pieces of equipment.
- In steady state, are the probabilities of being in each state all equal? Justify briefly. (In the remaining problems, assume that the steady state probabilities of being in each state are all equal.)
- Give the mean number of athletes using the stationary bike.
- What percentage of arriving customers who come to the exercise room, wanting to use the treadmill, but must leave in disgust because it's busy?
- What is the good throughput of the exercise room (i.e., the rate at which customers having exercised at both pieces of equipment happily leave the room)?