Part I: Introduction

1. What is a system design? The method or process design used by engineers to perform a certain task to its maximum potential

2. What is flow in relation to a system design? Smooth, uninterrupted movement

3. Give two examples of systems where you have witnessed a lack of flow. Cafeteria lines, airport security checks, doctors’ offices, checkout lines at grocery stores, etc.

What are some disadvantages of having lack of flow in a system design? Productivity isn’t at its maximum so profits aren’t maximized, unhappy customers, etc.

Part II: Hands-On Activity: Patient Flow Simulation

(See your teacher for instructions and materials.)
Part III: Data Analysis
(Complete Part III with the other students assigned to your Exam Room.)

Answer the following questions using the histograms created by the engineer at your station.

First Run Histogram
1. What is the minimum number of patients at any given time interval? 
   How many intervals have that number of patients? 

2. Are there any intervals with 0 patients? Why would that be a disadvantage? 

3. What is the maximum number of patients at any given time interval? 
   How many intervals have that number of patients? 

4. Are there any intervals with 3 or more patients? Why would that be a disadvantage? 

5. Over the course of the 1-hour simulation, in how many 5-minute intervals are patients being serviced? (How many intervals have at least one patient?) 

6. Over the course of the 1-hour simulation, in how many 5-minute intervals are patients waiting? (How many intervals have more than one patient?)
Second Run Histogram

1. What changes were made to the system design for the second run? **Exam Rooms are non-specific. (Doctors are cross-trained.)**

2. What is the minimum number of patients at any given time interval? __________
   How many intervals have that number of patients? __________

3. What is the maximum number of patients at any given time interval? __________
   How many intervals have that number of patients? __________

4. Over the course of the 1-hour simulation, in how many 5-minute intervals are patients being serviced? (How many intervals have at least one patient?) _______

5. Over the course of the 1-hour simulation, in how many 5-minute intervals are patients waiting? (How many intervals have more than one patient?) __________

6. Are these results better than the results from the First Run? __________Explain.__________
   __________________________________________________________________________
   __________________________________________________________________________

7. What other changes can be made to the system design for a better patient flow? **Add more doctors and/or exam rooms, but that would mean a significant cost increase.**