Seminar 4 (Suggested Solution)

1. Assuming a non-leap year : 1/6 1/24 2/11 3/1 3/19

2. Every seventh is better. If every fifth lot were inspected, than the output of only two machines would be inspected. If every seventh lot is inspected, then each machine's output will be inspected.

3.a. 200 x 3/4 = 150

b.

	Own Car	Public	Others	Total
Manual	60	75	15	150
Non-manual	25	20	5	50
Total	85	95	20	200

c. 95

d. Better to spread sample over more than one location and occasions, since : factory main gate might be used only by certain types of workers (i.e. shift workers who finish before 5 o' clock may not be considered)

Also, workers might resent the inconvenience and the statistician would find extracting the information difficult with so many people moving quickly. It will also be very difficult to count moving cars and interview people at the same time.

4. Yes. Systematic sampling is particularly useful when the population being sampling is randomly distributed. In this case, accidents are filed by date. For the purpose that the department has in mind, such a filing is at random. the department has no control over when the accidents happen so there seems little chance that there is any underlying systematic distribution; hence the results obtained from the sample will be representative of the population.

5. (c)

6. We need to remember that when we use stratified sampling, we are only acknowledging that the population is already divided into groups of different sizes. However, these groups are required to be relatively homogeneous before we can use this sampling method. In the case under question, Mary proposes dividing the population into groups such as urban, suburban, and rural; examination of the differences among these groups should convince you that they are reasonably homogeneous, and thus stratified sampling would work.

7. Stratified sampling is more appropriate in this case, since there appear to be two very dissimilar groups, which probably have smaller variation within each group than between groups.

7. In (b), the distributions have greater between-group variance and less within-group variance than in (a).

8. The major drawback of judgmental sampling is the lack of a measure of the validity of the sample as representative of the population.

10. Probability samples involve more rational analysis and planning at the beginning of a study and usually take more time and money than judgement samples.

11. A stratified random sample should be employed.

The objective of the survey is to compare the views of computer science majors with those of the rest of the student population. A well-designed stratified random sample should contain enough students of each type to allow reliable conclusions.

By using simple random sampling, a bias sample could possibly be produced. For instance, the sample may contain a majority of students who are not computer science major.