Question 1

A manager wants to estimate the proportion of faulty resistors produced (in a particular week). Individual units are selected at random times during the morning shift of each day and then tested for faults. In total 1520 resistors were tested and 18 if these were found to be faulty.

a. What is the population?

b. What is the sample?

c. What is the parameter? What symbol do we use? What is its value?

d. What is the statistic? What symbol do we use? What is its value?

e. Identify any potential bias.

Question 2

ITD wish to determine the duration of time that a UL student spends on Facebook each day. They send an email of enquiry to 500 students (by randomly selecting ID numbers) - 286 students respond. The mean time spent on Facebook in this sample was found to be 1.5 hours per day.

a. What is the population?

b. What is the sample?

c. What is the parameter? What symbol do we use? What is its value?

d. What is the statistic? What symbol do we use? What is its value?

e. Identify any potential bias.

Question 3

Classify the following data types.

a. Your age in years (20, 21, 30 etc.)

a. Temperature

b. Opinion of maths (dislike, indifferent, like)

c. Processor speed in gigahertz

d. Number of bugs in an application

e. Employment status (unemployed, employed, retired)

f. Gender (male, female)

g. Time taken to process some task

h. Income

i. Paying attention in class (yes, no)

j. Hard drive size in gigabytes

Question 4

In 2012 a survey found that 359 individuals used Android, 81 used Apple, 18 used BlackBerry, 18 used Windows and 24 used other devices.

a. What is the value of n?

b. Construct a frequency table (ordered highest to lowest frequency) and include a column with relative frequencies.

c. Estimate the proportion of individuals who use either Android or Apple devices.

d. Estimate the proportion of individuals who use other devices. What symbol would we use for this proportion?

e. What is the *true* proportion of individuals who use other devices? What symbol would we use for this proportion?

f. Draw the bar chart.

g. Comment on how the market has changed since 2011 (see lecture 1 for 2011).

Question 5

25 individuals were asked how long their laptop lasts on a full charge. The recorded times (measured in hours) are as follows:

2.2	0.4	4.2	12.9	1.5	3.0	5.7	0.7	1.0	3.3
0.2	0.2	5.6	1.6	3.0	0.1	14.3	3.4	0.9	6.1
1.4	1.0	0.7	5.4	2.3					

a. What is the value of n? What is the value of $\bar{x}$?

b. Construct a frequency table with 5 classes and let zero be the first breakpoint.

c. Include a column with relative frequencies.

d. Estimate the proportion of laptops that last more than 6 hours.

e. This estimated proportion is called a statistic - what is the true proportion called? What is its value?

f. Comment on the shape of the histogram.