**Higher Applications of Mathematics**

**Data and Sampling**

1. Write if each of the following are (Qualitative, discrete and continuous)

a) number of texts sent

b) colour of flowers

c) weight of a dog

d) Exam Grade

e) Time asleep

f) Population of a country

g) area of a floor

h) ticket prices

i) favourite football team

j) nationality of football players

h) number of trees in a forest

i) weight of a whale

j) Breeds of bird

k) number of eggs sold by a shop

2. For each of the following what kind of sample would you do if you were trying to survey the following?

Random, Cluster or Stratified

a) Glasgow city is going to go ask people on the high street if they should add another subway stop. (Think about if they should ask anyone)

b) Newton Mearns local council is trying to find out what people think about wifi in the area.

c) Hamilton FC are taking a survey on the toilet facilities at their football stadium (What is the issue if they did a random sample and only asked 10 randomly selected fans?0

d) A cinema is going to do a survey on what kind of films their customers prefer to watch.

3. A dentist wants to ask a random sample of patients how satisfied they are from the service they receive from her. Describe how she could select patients at random and what problems might be involved with doing this? (Potential bias)

4. A gardener wants to study the distribution of plants in a random sample of 20 square meters of land from a rectangular site that is 50m wide and 40m long. How could he select a random sample?

5. A factory has the following employees

|  |  |  |
| --- | --- | --- |
|  | Full Time | Part Time |
| Male | 80 | 36 |
| Female | 24 | 44 |

If the boss wanted to do a random survey of 40 employees, how many of each subgroup should they select if they wanted to do a random sample?

6. A shop looks at its customers and how much they spend per visit

|  |  |  |
| --- | --- | --- |
|  | Male | Female |
| Under £20 | 400 | 850 |
| £20+ | 700 | 750 |

If the shop wanted to do a survey of 200 random customers, then how many of each sub group should they select?

7. The table gives the number of entrants to higher education in one year.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Age | 18 | 19 | 20 | Other  | Total |
| Female | 94 775 | 42 640 | 11 950 | 33 980 | 183 345 |
| Male | 79 020 | 40 625 | 12 075 | 26 230 | 157 950 |
| Total | 173 795 | 83 265 | 24 025 | 60 210 | 341 295 |

a) A polling organisation wants to invite 10000 of the students to take part in a survey about their experiences of higher education. How many students should they use from each sub category

b) List other characteristics that might be relevant.

c) Are there any issues with this poll?

8. A sample is a small survey. A census is a collection of the entire population.

An estate agency wants to know the following should they use a census or a sample.

a) The number of houses in England with an empty room.

b) How long an advert should appear on a website.

c) The number of people who offer less than the asking price of a house.

9. Who should the following ask for its population.

The police in Durham trying to reduce car crime.