Statistics Revision Questions

LC HL Maths

1. Sampling and surveys

e.g. To gauge how its employees felt about proposed higher college fees, a university divided its employees into three categories: teaching staff, non-teaching staff and student employees. A random sample was selected from each group and they were telephoned and asked for their opinion.

(i) Describe the type of sampling being used by the university.

(ii) Give a reason why the university might have chosen this type of sampling.

(iii) Mention any possible bias that might exist in the sampling plan.

2. Controlled experiments and observational studies

e.g. A suggestion has been made that eating fast-food on a regular basis increases the incidence of requiring an appendectomy (surgical removal of the appendix). You want to conduct a study to test this suggestion.

(i) What is the precise goal of the study?
(ii) What is the target population?
(iii) Explain why a controlled experiment is not appropriate in this case.
(iv) Describe what type of observational study you would conduct.
(v) How would you gather your data?

3. Graphs

e.g. Twelve sample employees were chosen from each of two large companies, A and B. On a given day, the time taken (in minutes) by each employee to arrive at their place of work, measured from the moment they left their accommodation, was recorded.

A:	10	2	17	25	12	18	14
	12	10	6	32	11		
B:	8	17	25	16	24	33	32
	7	29	36	45	22		

(i) Draw a back to back stem plot to represent this data.
(ii) If one of these companies is based in a county town and the other in a large city such as Cork or Dublin, could you guess which is which? Give a reason.

4. Mean, median and mode

e.g. Consider the number of fingers that everybody in the world has on their right hand.

(i) What would you say the median number is?

(ii) What would you say the mode is?

(iii) Give a description of roughly what value the mean would be. Do you think this value is useful?

5. Range, percentiles and IQR

e.g. At a Garda speed checkpoint, the speeds of a number of vehicles, in km/h, were recorded as they passed a certain point. The data is given below.

57 59 64 48 52 58 67 54
53 58 72 61 55 60 57 58
73 66 59 56 53 61 54 59

68 85 57 84 58 60.

(i) Show this data on a stem plot.

(ii) Calculate the lower quartile and the upper quartile.

(iii) Calculate the interquartile range.

6. Standard deviation

e.g. The mean of the numbers 4, x, 13, 17, 27 is 14. Find the value of x. Calculate the standard deviation of these numbers.

7. Analysis of graphs

e.g. A frequency curve has a mode of 15 and a median of 13.

(i) Give a rough estimate of where the mean should lie.

(ii) Would you describe the frequency curve as symmetric, skewed left or skewed right? Give a reason.

(iii) Draw a frequency curve that fits the information given.

8. Scatterplots and correlation coefficient

e.g. For a number of patients undergoing kidney dialysis, measurements of heart rate (X) and blood pressure (Y) were taken. The data is given below in the form of couples (x, y).

(83,141), (86,162), (88,161),
(92,154), (94,171), (98,174),
(101,184), (114,190), (117,187),
(121,191)

(i) Represent the data on a scatterplot.
(ii) Use the scatterplot to estimate the correlation coefficient.
(iii) Calculate the correlation coefficient.
(iv) How accurate was your estimate from the scatterplot?
(v) Draw by eye the line of best fit.