1 Alice carries out a survey of the 28 students in her class to find how many text messages each sent on the previous day. Her results are shown in the stem and leaf diagram.

0	0	0	1	1	3	5	7	7	7	8	8
1	0	1	2	3	3	4	4	6	9		
2	0	1	3	3	7						
3	5	7									
4											
5	8										

Key: 2 | 3 represents 23

(i) Find the mode and median of the number of text messages. [2]

(ii) Identify the type of skewness of the distribution. [1]

(iii) Alice is considering whether to use the mean or the median as a measure of central tendency for these data.

(*A*) In view of the skewness of the distribution, state whether Alice should choose the mean or the median. [1]

(*B*) What other feature of the distribution confirms Alice's choice? [1]

(iv) The mean number of text messages is 14.75. If each message costs 10 pence, find the total cost of all of these messages. [2]

2 The total annual emissions of carbon dioxide, x tonnes per person, for 13 European countries are given below.

6.2 6.7 6.8 8.1 8.1 8.5 8.6 9.0 9.9 10.1 11.0 11.8 22.8

(i) Find the mean, median and midrange of these data. [4]

(ii) Comment on how useful each of these is as a measure of central tendency for these data, giving a brief reason for each of your answers. [3]

3 Every day, George attempts the quiz in a national newspaper. The quiz always consists of 7 questions. In the first 25 days of January, the numbers of questions George answers correctly each day are summarised in the table below.

Number correct	1	2	3				
Frequency	1	2	3				

(i) Draw a vertical line chart to illustrate the data. [2]

(ii) State the type of skewness shown by your diagram. [1]

(iii) Calculate the mean and the mean squared deviation of the data. [3]

(iv) How many correct answers would George need to average over the next 6 days if he is to achieve an average of 5 correct answers for all 31 days of January? [2]

4 Answer part (i) of this question on the insert provided.

A taxi driver operates from a taxi rank at a main railway station in London. During one particular week he makes 120 journeys, the lengths of which are summarised in the table.

Length (x miles)	$0 < x \leqslant 1$	$1 < x \leqslant 2$	$2 < x \leqslant 3$	$3 < x \leqslant 4$	$4 < x \leqslant 6$	$6 < x \leqslant 10$
Number of journeys	38	30	21	14	9	8

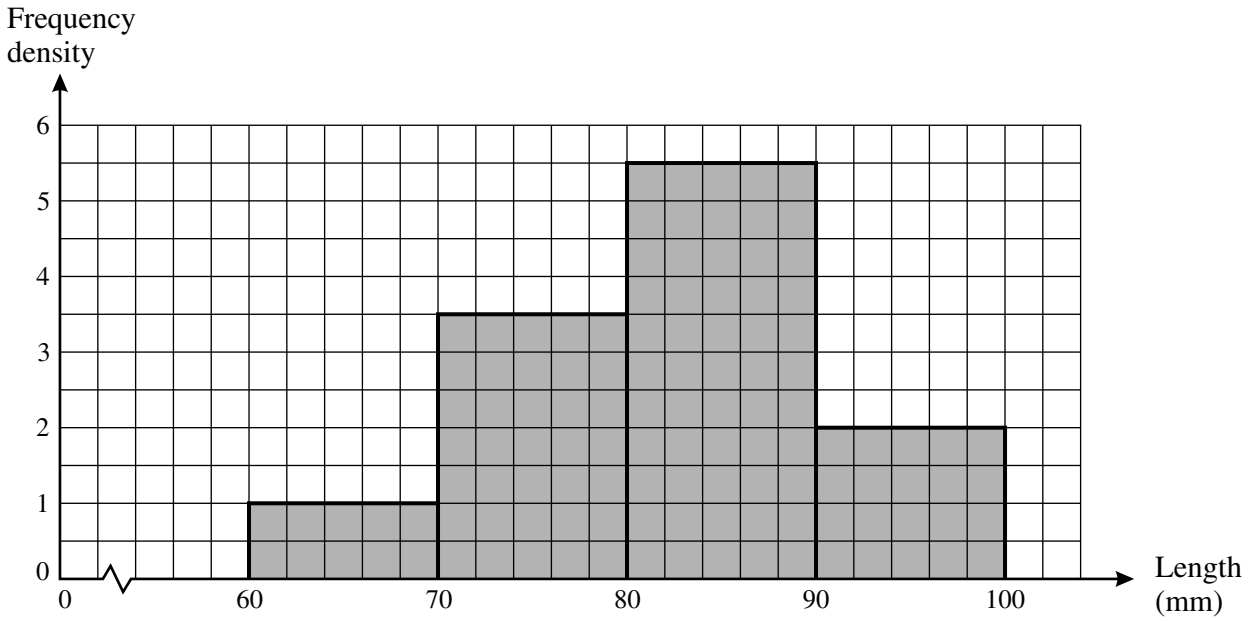
(i) On the insert, draw a cumulative frequency diagram to illustrate the data. [3]

(ii) Use your graph to estimate the median length of journey and the quartiles.

Hence find the interquartile range. [4]

(iii) State the type of skewness of the distribution of the data. [1]

5 A pear grower collects a random sample of 120 pears from his orchard. The histogram below shows the lengths, in mm, of these pears.



(i) Calculate the number of pears which are between 90 and 100 mm long. **[2]**

(ii) Calculate an estimate of the mean length of the pears. Explain why your answer is only an estimate. **[4]**

(iii) Calculate an estimate of the standard deviation. **[3]**

(iv) Use your answers to parts **(ii)** and **(iii)** to investigate whether there are any outliers. **[4]**

(v) Name the type of skewness of the distribution. **[1]**

(vi) Illustrate the data using a cumulative frequency diagram. **[5]**

6 The times taken for 480 university students to travel from their accommodation to lectures are summarised below.

Time (t minutes)	$0 \leqslant t < 5$	$5 \leqslant t < 10$	$10 \leqslant t < 20$	$20 \leqslant t < 30$	$30 \leqslant t < 40$	$40 \leqslant t < 60$
Frequency	34	153	188	73	27	5

(i) Illustrate these data by means of a histogram. [5]

(ii) Identify the type of skewness of the distribution. [1]