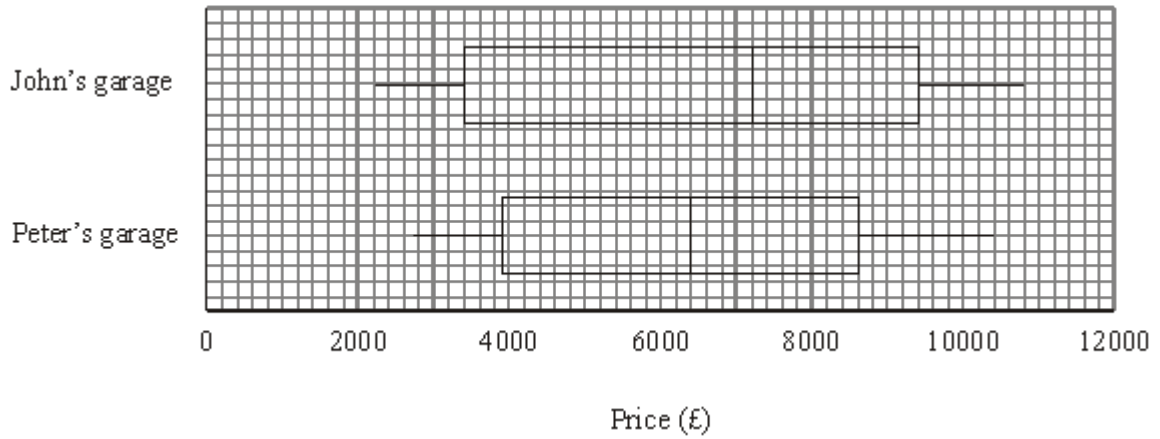


Q1. John and Peter each own a garage.
They both sell used cars.

The box plots show some information about the prices of cars at their garages.



Compare the distribution of the prices of cars in these two garages.
Give **two** comparisons.

- 1
-
- 2
-

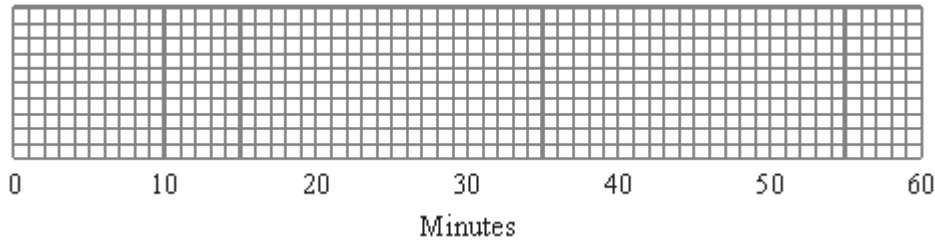
(Total 2 marks)

Q2. On Friday, Peter went to the airport.
He recorded the number of minutes that each plane was delayed.
He used his results to work out the information in this table.

	Minutes
Shortest delay	0
Lower quartile	2
Median	8
Upper quartile	18

Longest delay	41
---------------	----

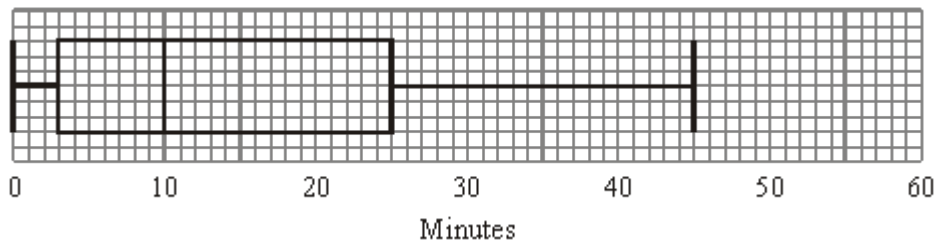
(a) On the grid, draw a box plot to show the information in the table.



(2)

Peter also went to the airport on Saturday.
He recorded the number of minutes that each plane was delayed.

The box plot below was drawn using this information.



(b) Make two comparisons between the distributions of plane delays on Friday and on Saturday.

.....

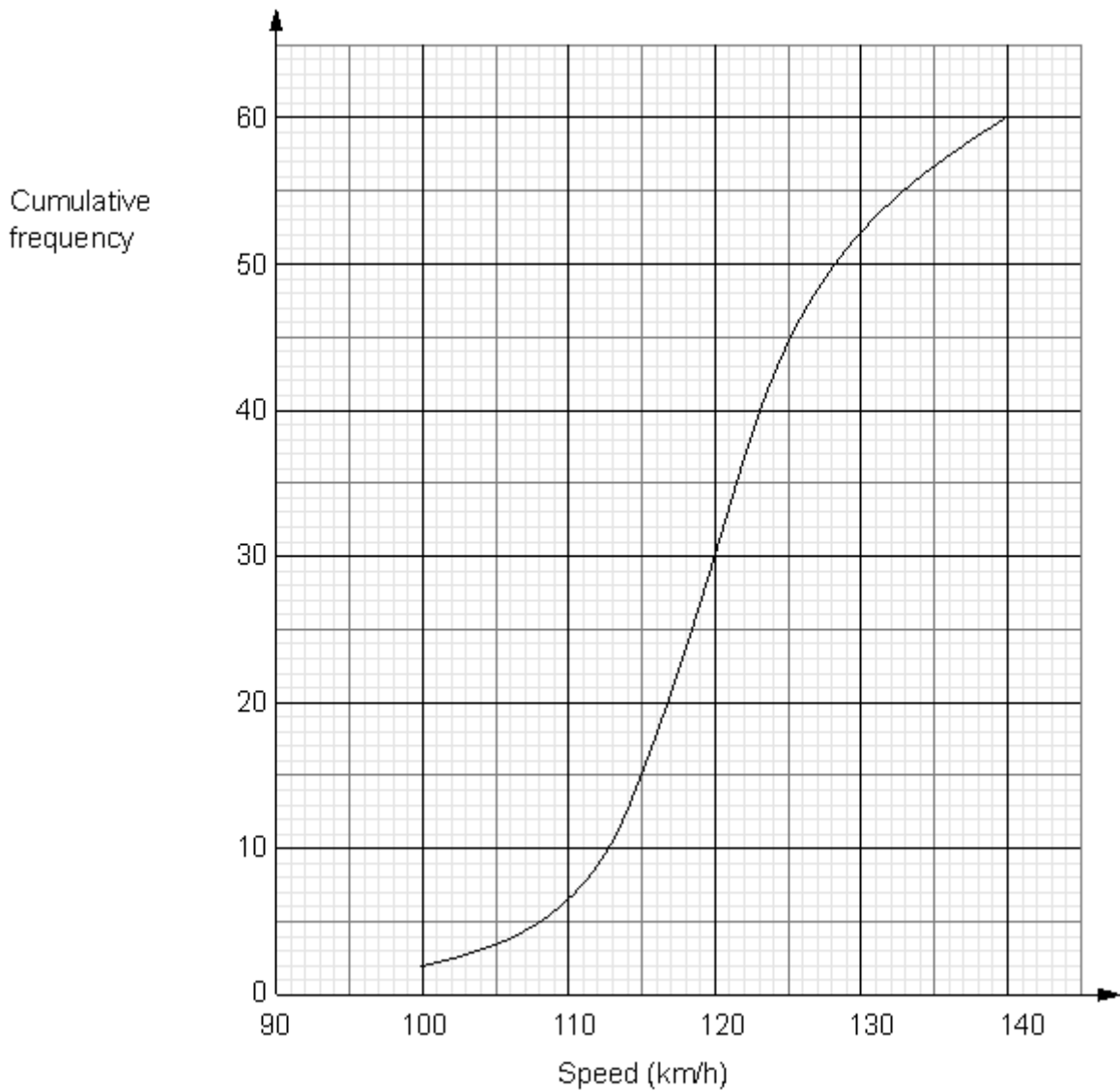
.....

.....

.....

(2)
(Total 4 marks)

Q3. The cumulative frequency graph shows information about the speeds of 60 cars on a motorway one Sunday morning.



(a) Use the graph to find an estimate for the median speed.

..... km/h

(1)

The speed limit on this motorway is 130 km/h.
 The traffic police say that more than 20% of cars travelling on the motorway break the speed limit.

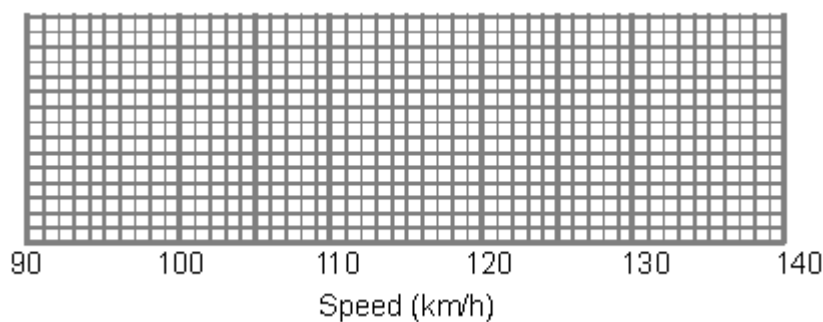
(b) Comment on what the traffic police say.

(3)

For these 60 cars

the minimum speed was 97 km/h
and the maximum speed was 138 km/h.

- (c) Use the cumulative frequency graph and the information above to draw a box plot showing information about the speeds of the cars.



(3)
(Total 7 marks)

- Q4.** Kelly recorded the length of time 48 teachers took to travel to school on Monday.

The table shows information about these travel times in minutes.

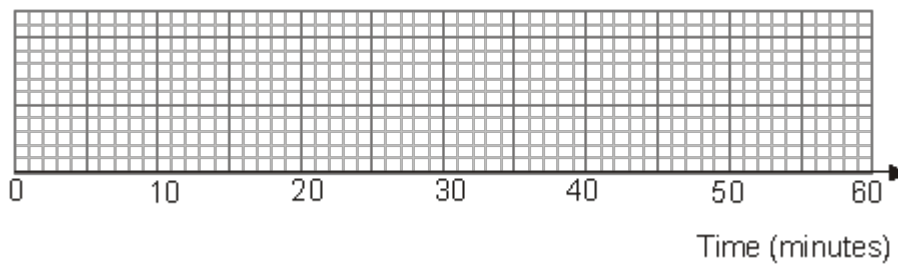
Least time	5
Greatest time	47
Median	28
Lower quartile	18
Upper quartile	35

(a) Work out the number of teachers with a travel time of 35 minutes or more.

.....

(2)

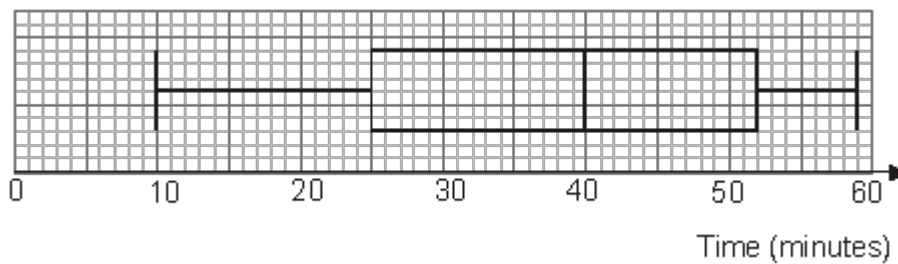
(b) On the grid, draw a box plot to show the information in the table.



(2)

Kelly then recorded the times the same 48 teachers took to travel to school on Tuesday.

The box plot shows some information about these times.

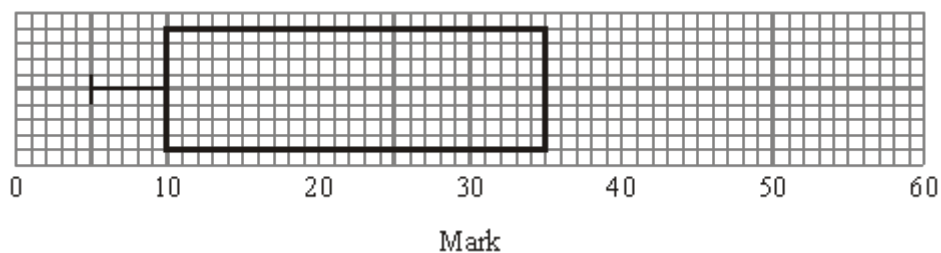


(c) Compare the travel times on Monday and on Tuesday.

.....

(2)
 (Total 6 marks)

Q5. The incomplete box plot and table show some information about some marks.



	Mark
Lowest mark	5
Lower quartile	
Median	30
Upper quartile	35
Highest mark	55

(a) Use the information in the table to complete the box plot.

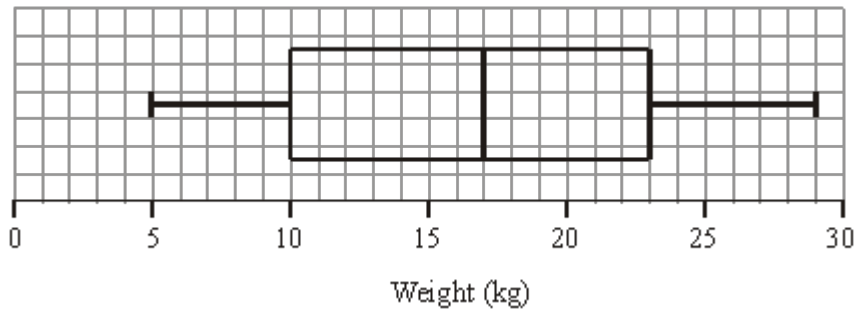
(2)

(b) Use the information in the box plot to complete the table.

(1)

(Total 3 marks)

Q6. The box plot gives information about the distribution of the weights of bags on a plane.



(a) Jean says the heaviest bag weighs 23 kg.

She is **wrong**.
Explain why.

.....
.....

(1)

(b) Write down the median weight.

..... kg

(1)

(c) Work out the interquartile range of the weights.

..... kg

(1)

There are 240 bags on the plane.

(d) Work out the number of bags with a weight of 10 kg or less.

.....

(2)
(Total 5 marks)

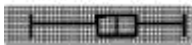
M1.

Answer	Mark	Additional Guidance
2 comparisons	2	B1 for a comparison of a specific value, e.g. John's median is greater than Peter's median B1 for a comparison of spread, e.g. John's range is wider than Peter's range (watch out for two comparisons given together)
Total for Question: 2 marks		

M2.

	Working	Answer	Mark	Additional Guidance
(a)		Box plot	2	B1 for ends of whiskers at 0 and 41 (with an appropriate box) B1 for ends of box at 2 and 18 with median at 8
(b)		2 comparisons	2	B2 for two comparisons with at least one on spread (B1 for one comparison of spread or one comparison of values)
Total for Question: 4 marks				

M3.

	Working	Answer	Mark	Additional Guidance
(a)		120	1	B1 for 119.5 – 120.5
(b)	60 – 52 = 8 20% of 60 = 12	Claim not true since 8 < 20% of 60	3	M1 for using graph at 130, may be implied by a value in the range 52 to 53 seen A1 for 8 (cars breaking speed limit) or 13.(3..)% (accept 7 or 11.(6..)%) A1 for correct conclusion with fully correct working OR M1 for using cf = 48 A1 for (20% of cars exceed) value in the range 126.5 to 127.5 km/h A1 for correct conclusion with fully correct working
(c)			3	B3 for complete box plot with all three aspects Aspect 1: ends of whiskers at 97 and 138 Aspect 2: ends of box at 115 and 125 Aspect 3: median marked at 120 or ft (a) (B2 for two aspects, B1 for one aspect) (Allow tolerance of $\frac{1}{2}$ square)
Total for Question: 7 marks				

M4.

	Working	Answer	Mark	Additional Guidance
(a)	48 ÷ 4	12	2	M1 48 ÷ 4 or 49 ÷ 4 or 48 – 36 A1 for 12
(b)		Box plot drawn	2	B2 fully correct box plot (B1 for the box plot drawn with one plotting error)
(c)		On Tuesday:	2	B1 for median higher on Tuesday or journeys

		Median higher (IQ) Range higher.	took longer on Tuesday B1 for (IQ) range higher on Tuesday or more variation in journey length on Tuesday. (NB: For B2 at least one comparison must be in context)
Total for Question: 6 marks			

M5.

	Working	Answer	Mark	Additional Guidance
(a)	Complete box plot	Median Highest mark	2	B1 line drawn at 30 and no other lines drawn within box B1 whisker drawn to 55
(b)	Complete table	10	1	B1 for 10
Total for Question: 3 marks				

M6.

	Working	Answer	Mark	Additional Guidance
(a)		Heaviest bag is 29kg	1	B1 for 23kg is the upper quartile oe, or the heaviest bag is 29kg oe, or 25% of bags are heavier than 23kg or range is 5 – 29 oe
(b)		17	1	B1 for 17 cao
(c)	23 – 10	13	1	B1 for 13 cao

(d)	$\frac{25}{100} \times 240$	60	2	M1 for $\frac{25}{100} \times 240$ oe or $\frac{25}{100} \times 241$ oe A1 for 60 cao (SC: B1 for 25% or 0.25 or quarter seen)
Total for Question: 5 marks				

- E1.** The majority of candidates were able to score at least one mark for this question; usually for comparing point values such as the lowest prices, the highest prices and the medians. Comparison of the ranges was more popular than the comparison of the interquartile ranges.

A significant number of candidates gave two comparisons of ranges or two comparisons of point values. Unacceptable 'comparisons' typically involved vague statements such as "the median in John's garage is £7200 and the median in Peter's garage is £6400" and "the cars in John's garage are more expensive than the cars in Peter's garage".

- E2.** Nearly all candidates managed to draw the box plot accurately in part (a) taking care to position their lines and box very precisely. The second box plot in the question had been drawn in and provided sufficient guidance as to what was required thus enabling many to gain full marks in part (a).

Part (b) appeared to be more challenging as many struggled to form a comparison between the two box plots. Firstly it was encouraging to see that many candidates successfully avoided simply listing the various components of the box plots without making a comparison. To simply say that 'the highest value on Saturday is 45 and on Friday is 41' does not compare the two values it merely states the values. The statement 'the longest delay on Saturday is greater than the longest delay on Friday' affords a comparison between the two. Most responses picked out a value for a comparison and scored 1 mark with some continuing to make a valid fact about range or interquartile range to secure the second mark. The alternative approach was to make a comparison between the ranges and between the interquartile ranges on each day and this would have scored both marks. It was not unusual to see a description relating to 'airports' in general with 'bad weather' or 'airports are busier at weekends' being in the top two.

Unfortunately neither fact can be picked up from the information given in this question, nor could any facts about the amount of planes that were delayed. Some candidates clearly did not read the question carefully, assuming that only the second box plot was Peter's or indeed, that the days included Sunday. Nearly two thirds of the candidates scored at least 3 marks for this question.

##

It is encouraging to report that well over 80% of candidates were able to find an estimate for the median speed. Part (b) was more challenging and a substantial proportion of candidates did not

appreciate the need to use the graph to estimate how many cars broke the speed limit. These candidates often restricted themselves to working out 20% of 60 or even 20% of 130 km/h. Other candidates provided a correct, concise and clear argument to support their conclusion that the police were wrong. Good attempts were made to draw an accurate box and whisker diagram, with few candidates not knowing what was expected. Many weaker candidates were able to gain some marks here. The drawing of the whiskers and the median was generally well done. However candidates' attempts at finding and drawing the lower and upper quartiles were less successful.

##

In part (a), candidates appeared to find this question challenging. Some scripts were blank and many had the answer of 12 but it clearly came from incorrect working usually, the calculation $47 - 35$ (greatest time – upper quartile), and so scored no marks. Some candidates calculated 75% of 48 to give 36 but then failed to subtract this from 48.

The majority of candidates attempted the box plot and usually scored full marks for part (b). The most common error was plotting 48 not 47 or omitting the median.

In part (c) many candidates concluded that journey times were longer on Tuesday than they were on Monday or that the median time was higher. However comparison of range or interquartile range was less common. Unfortunately many just listed times for Monday and times for Tuesday without making any comparison. One mark was often awarded for a correct comparison and the second mark not awarded as no context was offered for these comparisons.

E5. In part (a), most candidates were able to draw a correct whisker on the box plot, but many either did not know how to draw the median or did not realise that the median was missing from the diagram and therefore needed to be included. A common mistake for some candidates was to draw more than one vertical line in the box plot. In part (b), most candidates were able to write down the value 10 for the lower quartile, but some, presumably dividing the scale into quarters, gave 15 (or 20) as this value.

E6. Most answered this part (a) correctly. There were some who stated that 30kg was the heaviest bag. The majority of candidates were able to score marks in (b) and (c). However, part (d) was very poorly answered on the whole. Good candidates realised that those less than 10 represented the lower quartile as seen at the start of the question. They used the diagram given at the start of the question and either said $240/4 = 60$ or said

$240/2 = 120$ which gives the median and then said $120/2 = 60$. Errors included $240/5 = 48$ the 5 being taken from $10-5$. Range = $(29 - 5) = 24$ then $240/24$ is 10 and $10 \times 5 = 50$ the 5 being taken from $10-5$ and $240/6 = 40$.