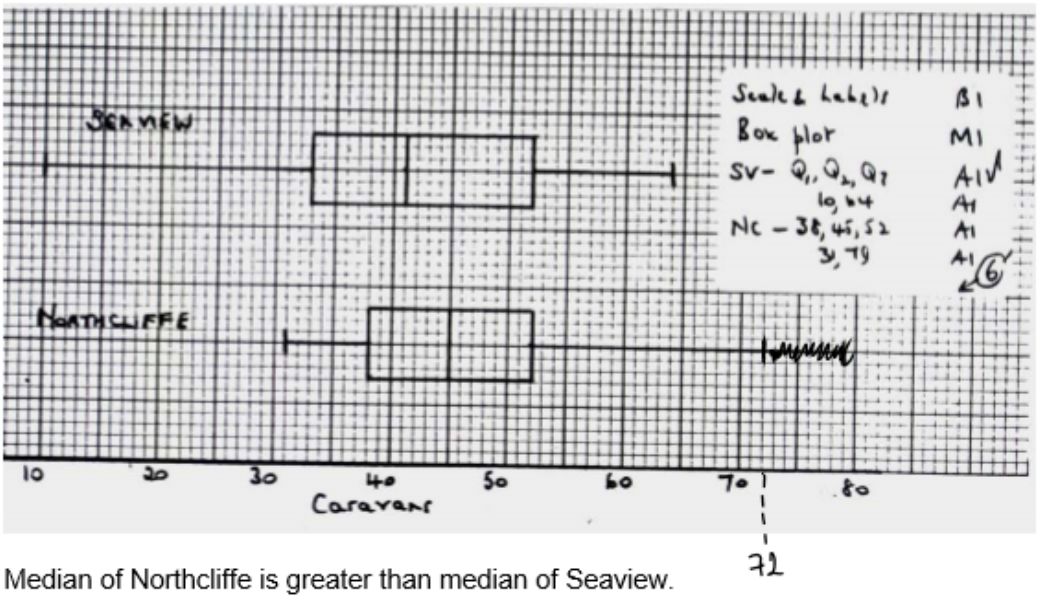
Representations of Data: Boxplots - Edexcel Past Exam Questions MARK SCHEME

Question 1 : Jan 05 Q2

(a)



(6)

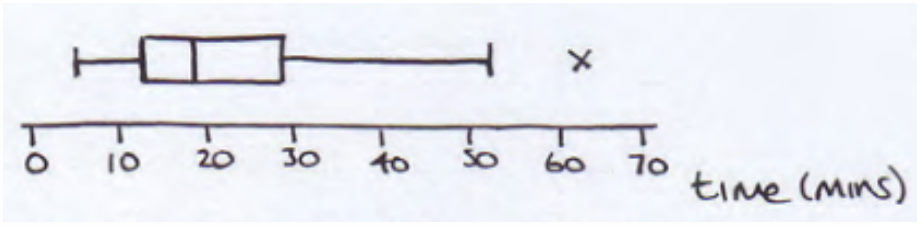
(b) Median of Northcliffe is greater than median of Seaview.
Upper quartiles are the same
IQR of Northcliffe is less than IQR of Seaview
Northcliffe positive skew, Seaview negative skew any 3 acceptable comments **B1B1B1**

(3)

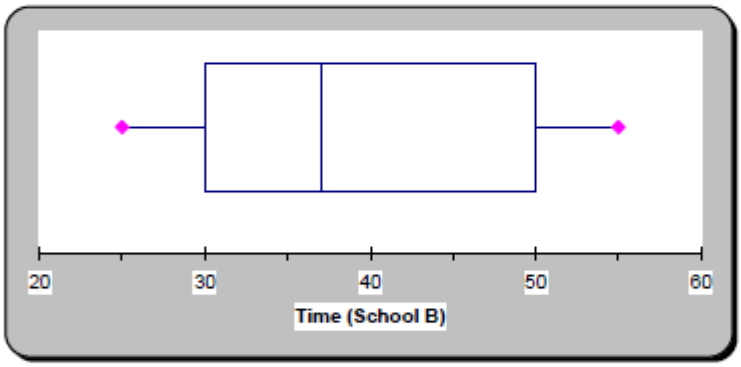
(c) On 75% of the nights that month **B1**
both had no more than 52 caravans on site. **B1**

(2)
(Total 14 marks)

Question 2 : June 05 Q4

(a)	$1.5\,(Q_3 - Q_1) = 1.5\,(28 - 12) = 24$	may be implied	B1
	$Q_3 + 24 = 52 \Rightarrow 63$ is an outlier	att Q3 +… or Q1 - …, 52 and -12or <0 or evidence of no lower outliers	M1, A1
	$Q_1 - 24 < 0 \Rightarrow$ no outliers	63 is an outlier	A1
			M1 A1 A1 (7)
(b)	Many delays are small so passengers should find these acceptable or sensible comment in the context of the question.		B1 (1)

Question 3 : June 06 Q1

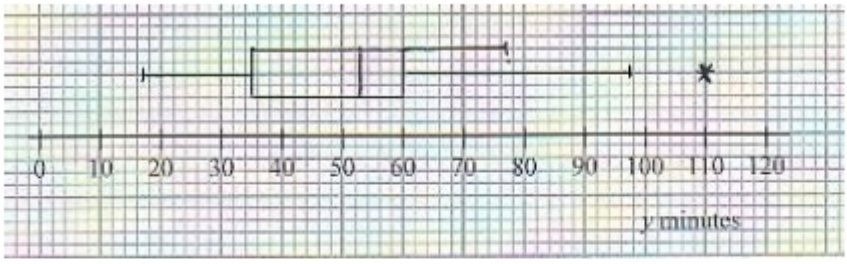
(a)	Indicates max / median / min / upper quartile/ lower quartile (2 or more) Indicates outliers (or equivalent description) Illustrates skewness (or equivalent description e.g. shape) Any 3 rows Allows comparisons Indicates range / IQR / spread	B1 B1 B1 (3)
(b)(i)	37 (minutes)	B1
(ii)	Upper quartile or Q_3 or third quartile or 75^{th} percentile or P_{75}	B1 (2)
(c)	Outlier s How to calculate correctly 'Observations that are very different from the other observations and need to be treated with caution' These two children probably walked / took a lot longer Any 2	 B1 B1 (2)
(d)	 Box & median & whiskers Sensible scale 30,37,50 25,55	 M1 B1 B1 B1 (4)
(e)	Children from school A generally took less time Any correct 4 lines 50% of B ≤ 37 mins, 75% of A < 37 mins (similarly for 30) Median/Q1/Q3 of A < median/Q1/Q3 of B (1 or more) A has outliers, (B does not) Both positive skew IQR of A<IQR of B, range of A>range of B	 B1 B1 B1 B1 (4)

Question 4 : June 07 Q2

Question Number	Scheme	Marks
(a)	$\frac{1}{2}$	**B1** (1)
(b)	54	**B1** (1)
(c)	+ is an 'outlier' or 'extreme value' Any heavy musical instrument or a statement that the instrument is heavy	**B1** **B1** (2)

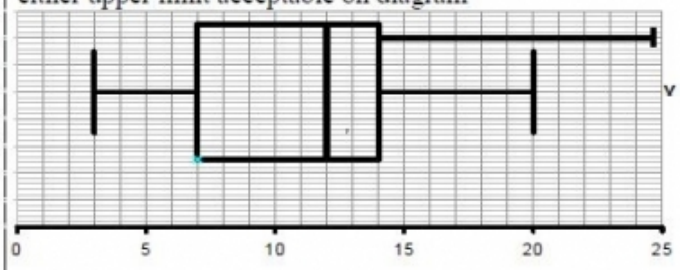
Notes	
(a)	Accept 50% or half or 0.5. Units not required.
(b)	Correct answer only. Units not required.
(c)	'Anomaly' only award B0 Accept '85kg was heaviest instrument on the trip' or equivalent for second B1. Examples of common acceptable instruments; double bass, cello, harp, piano, drums, tuba Examples of common unacceptable instruments: violin, viola, trombone, trumpet, french horn, guitar

Question 5 : Jan 09 Q4

Question Number	Scheme	Marks
(a)	$Q_2 = 53, \quad Q_1 = 35, \quad Q_3 = 60$	B1, B1,B1 (3)
(b)	$Q_3 - Q_1 = 25 \Rightarrow Q_1 - 1.5\times 25 = -2.5$ (no outlier)	M1
	$Q_3 + 1.5\times 25 = 97.5$ (so 110 is an outlier)	A1 (2)
(c)		M1 A1ft A1ft (3)

(a)	1st B1	for median
	2nd B1	for lower quartile
	3rd B1	for upper quartile
(b)	M1	for attempt to find one limit
	A1	for both limits found and correct. No explicit comment about outliers needed.
(c)	M1	for a box and two whiskers
	1st A1ft	for correct position of box, median and quartiles. Follow through their values.
	2nd A1ft	for 17 and 77 or "their" 97.5 and *. If 110 is not an outlier then score A0 here.
		Penalise no gap between end of whisker and outlier. Must label outlier, needn't be with *.
	Accuracy	should be within the correct square so 97 or 98 will do for 97.5

Question 6 : Jan 11 Q3

Question Number	Scheme	Marks
(a)	Outliers $14 + 1.5\times(14-7) = 24.5$ $7 - 1.5\times(14-7) = -3.5$ Outlier 25 either upper limit acceptable on diagram  Sales in £'000	M1 A1 M1 A1ft B1 (5)
(c)	not true since the lower quartile is 7000 and therefore 75% above 7000 not 10000 or 10 is inside the box or any other sensible comment	B1 dB1 (2)

	Notes
(a)	**A fully correct box-plot (either version) with no supporting work scores 5/5. Otherwise read on** 1st M1 for at least one correct calculation seen 1st A1 for 24.5 and −3.5 (or just negative noted) seen. May be read off the graph. If both values are seen but no calculation is given then M1A1,one value M1A0. 2nd M1 for a box with an upper and a lower whisker(s) with at least 2 correct values (condone no median marked) 2nd A1ft for 3.7, 12, 14 and 20 or 24.5 in appropriate places and readable off their scale If <u>both</u> upper whiskers are seen A0 Apply ft for their <u>whiskers</u> being compatible with their <u>outlier limits</u> e.g. if their lower limit is + 3.5 then a lower whisker ending at 4 or 3.5 is OK B1 for only one outlier appropriately marked at 25 **Apply ± 0.5 square accuracy for diagram**

(c)	1st B1 for rejecting the company's claim 2nd dB1 for an appropriate supporting reason. Dependent on rejecting company's claim.