Question Number	Scheme	Marks
2 (a)	[Range = 0.87 – 0.21] = **0.66**	B1
		(1)
(b)	Median (24th value) = = **0.48**	B1
		(1)
(c)	LQ (12th value) = 0.35 0.31 = UQ – "0.35" [UQ = 0.66] a = **6**	B1 M1 A1
		(3)
(d)	$\text{sd} = \sqrt{\frac{13.4228}{47} - \left(\frac{23.72}{47}\right)^2}$ **or** $S_{xx} = 13.4228 - \frac{23.72^2}{47}$ [= 1.4517...] and $\text{sd} = \sqrt{\frac{S_{xx}}{47}}$	M1
	= 0.17575… = **0.176***	A1*
		(2)
(e)(i)	$\frac{\sum y + 23.72}{65} = 0.502$ **or** $0.502 \times 65 = 32.63$	M1
	$32.63 = \sum y + 23.72$ **8.91***	A1*
		(2)
(ii)	$0.204 = \sqrt{\frac{\left[13.4228 + \sum y^2\right]}{65} - 0.502^2}$ **or** $0.204^2 = \frac{\left[13.4228 + \sum y^2\right]}{65} - 0.502^2$	M1
	$\sum y^2 = (0.204^2 + 0.502^2) \times 65 - 13.4228$	M1
	=5.6625 awrt **5.66**	A1
		(3)
	Notes	**Total 12**

(a)	**B1**	0.66 oe
(b)	**B1**	0.48 oe (do not accept 4|8)
(c)	**B1**	LQ = 0.35 stated or implied allow 35 for this mark (but 35.25 or the UQ = 35th value is B0).
	M1	0.31 = UQ – "0.35" allow any rearrangement of this for M1 Condone eg 0.6a for UQ Also allow use of 35 + 31 for this mark (implied by 66 or 0.66)
	A1	cao May come from poor notation eg 0.6a = 0.66 Do not isw. Do not award for 66 or 0.66
(d)	**M1**	Use of correct formula (need $\sqrt{\ }$) $\sqrt{\frac{13.4228}{47} - \frac{23.72^2}{47}}$ is M0
	A1*	awrt 0.176 with correct exact working seen allow awrt 0.176 coming from 0.1757…or better allow awrt 0.176 with the mean to 0.5046… or better seen Note: Inaccurate working on its own scores M1A0 eg $\sqrt{\frac{13.4228}{47} - 0.505^2} = 0.176$ (note s = 0.17765… send to review)
(e)(i)	**M1**	For a correct equation for sample mean **or** for 0.502× 65 (implied by 32.63 seen)
	A1*	8.91 cso Correctly rearranging $\sum y$ leading to given answer with 1 line of intermediate working. $\sum y = 0.502 \times 65 - 23.72 = 8.91$ is M1A1 Condone poor notation for A1 but working must be correct.
(ii)	**M1**	Use of correct standard deviation or variance formula seen For this mark we only require 0.204, 65 and 0.502 in the correct places – allow any numerator

	M1	Find $\sum y^2$ using correct order of operations on $a = \sqrt{\frac{b+\sum y^2}{65} - c}$ **or** $m = \frac{n+\sum y^2}{65} - p$ $b \neq 0, n \neq 0$ At least 1 line of rearrangement from **variance** must be shown to score this mark. Condone poor notation for $\sum y^2$ (may be implied by awrt 5.66)
	A1	awrt 5.66 (SC attempting to use s gives 5.62 send to review)