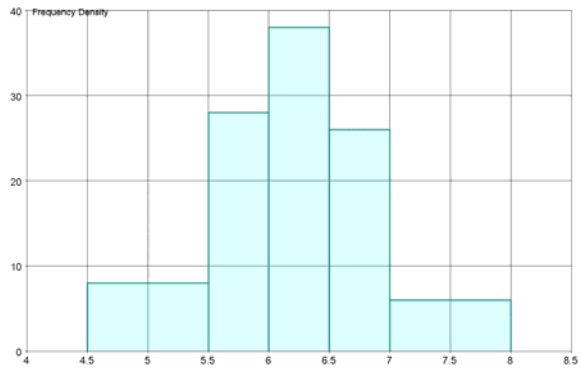
1 **(i)**	Median = 3370 Q_1 = 3050 Q_3 = 3700 Inter-quartile range = 3700 – 3050 = 650	B1 B1 for Q_3 or Q_1 B1 for IQR	**3**
(ii)	Lower limit 3050 – 1.5 × 650 = 2075 Upper limit 3700 + 1.5 × 650 = 4675 Approx 40 babies below 2075 and 5 above 4675 so total 45	B1 B1 M1 (for either) A1	**4**
(iii)	Decision based on convincing argument: eg 'no, because there is nothing to suggest that they are not genuine data items and these data may influence health care provision'	E2 for convincing argument	**2**
(iv)	All babies below 2600 grams in weight	B2 CAO	**2**
(v)	(*A*) $X \sim B(17, 0.12)$ $P(X = 2) = \binom{17}{2} \times 0.12^2 \times 0.88^{15} = 0.2878$ (*B*) $P(X > 2)$ $= 1 - (0.2878 + \binom{17}{1} \times 0.12 \times 0.88^{16} + 0.8^{17})$ $= 1 - (0.2878 + 0.2638 + 0.1138) = 0.335$	M1 $\binom{17}{2} \times p^2 \times q^{15}$ M1 indep $0.12^2 \times 0.88^{15}$ A1 CAO M1 for $P(X=1) + P(X=0)$ M1 for $1 - P(X \leq 2)$ A1 CAO	**3** **3**
(vi)	Expected number of occasions is 33.5	B1 FT	**1**
		TOTAL	**18**

2 **(i)**	The range = 55 – 15 = 40 The interquartile range = 35 – 26 = 9	B1 CAO B1 CAO	**2**
(ii)	 35 + 1.5 x 9 = 48.5 26 – 1.5 x 9 = 12.5 Any value > 48.5 is an outlier (so 55 will be an outlier),	 M1 for 48.5 oe M1 for 12.5 oe A1 (FT their IQR in (i))	**3**
(iii)	One valid comment such as eg: Positively skewed Middle 50% of data is closely bunched	E1	**1**
		TOTAL	**6**

<table>
<tr><td>3
(i)</td><td>Mean score = (2x8 + 3x7 + 4x6 + 5 + 4)/11 =

6.36</td><td>M1 for $\sum fx/11$
A1 CAO</td><td>2</td></tr>
<tr><td>(ii)</td><td> 

Mean GCSE Score</td><td>G1 Linear sensible scales

G1 fds of 8, 28, 38, 26, 6 or 4k, 14k, 19k, 13k, 3k for sensible values of k either on script or on graph.

G1 (dep on reasonable attempt at fd) Appropriate label for vertical scale eg ‘Frequency density’, ‘frequency per ½ unit’, ‘students per mean GCSE score’. (allow Key)</td><td>3</td></tr>
<tr><td>(iii)</td><td><table>
<tr><th>Mid point, x</th><th>f</th><th>x</th><th>fx²</th></tr>
<tr><td>5</td><td></td><td>40</td><td>200</td></tr>
<tr><td>5.75</td><td></td><td>80.5</td><td>462.875</td></tr>
<tr><td>6.25</td><td></td><td>118.75</td><td>742.1875</td></tr>
<tr><td>6.75</td><td></td><td>87.75</td><td>592.3125</td></tr>
<tr><td>7.5</td><td></td><td>45</td><td>337.5</td></tr>
<tr><td></td><td>60</td><td>372</td><td>2334.875</td></tr>
</table>
Sample mean = 372/60 = 6.2

$S_{xx} = 2334.875 - \frac{372^2}{60} = 28.475$
Sample s.d = $\sqrt{\frac{28.475}{59}} = 0.695$</td><td>B1 mid points

B1FT $\sum fx$ and $\sum fx^2$

B1 CAO

M1 for their S_{xx}

A1 CAO</td><td>5</td></tr>
<tr><td>(iv)</td><td>Prediction of score = 13 x 7.4 – 46 = 50.2
So predicted AS grade would be B</td><td>M1 For 13 x 7.4 – 46
A1 dep on 50.2 (or 50) seen</td><td>2</td></tr>
<tr><td>(v)</td><td>Prediction of score = 13 x 5.5 – 46 = 25.5

So predicted grade would be D/E
(allow D or E)
Because score roughly halfway from 20 to 30,
OR (for D) closer to D than E
OR (for E) past E but not up to D boundary</td><td>M1 For 13 x 5.5 – 46

A1 dep on 25.5 (or 26 or 25) seen
E1 For explanation of conversion – logical statement/argument that supports their choice.</td><td>3</td></tr>
<tr><td>(vi)</td><td>Mean = 13 x 6.2 – 46 = 34.6
Standard deviation = 13 x 0.695 = 9.035</td><td>B1 FT their 6.2
M1 for 13 x their 0.695
A1 FT</td><td>3</td></tr>
<tr><td></td><td></td><td>TOTAL</td><td>18</td></tr>
</table>

Qn	Answer	Mk	Comment
4			
(i)	Mean = 657/20 = 32.85	B1 cao	
	Variance = $\frac{1}{19}(22839 - \frac{657^2}{20}) = 66.13$	M1 A1 cao	
(ii)	Standard deviation = 8.13		
	32.85 + 2(8.13) = 49.11	M1 ft	Calculation of 49.11
	none of the 3 values exceed this so no outliers	A1 ft	