

1. (a)

Grade	Frequency
1	1
2	4
3	(2)
4	3
5	(4)
6	5
7	(1)

(A2) (C2)

*Note: Award (A1) for three correct.
Award (A0) for two or fewer correct.*

(b) Mode = 6 (A1)(ft) (C1)

(c) Median = 4.5 (M1)

Note: (M1) for attempt to order raw data (if frequency table not used) (A1)(ft)

or (M1) halfway between 10th and 11th result. (C2)

(d) (0.35, 35 %) (A1)(ft) (C1)

[6]

2. **Unit penalty (UP) applies in part (a) in this question**

(a) Median = 11m (A1) (C1)

(b) Interquartile range = 14 – 10 (A1)
= 4 (A1)(ft) (C2)

Note: (M1) for taking a sensible difference or for both correct quartile values seen.

(c)

correct median (A1)(ft)
correct quartiles and box (A1)(ft)
endpoints at 3 and 28, joined to box by straight lines (A1) (C3)

*Note: Award (A0) if the lines go right through the box.
Award final (A1) if the whisker goes to 20 with an outlier at 28*

[6]

3. **Unit penalty (UP) applies in part (c) in this question.**

(a)

(A1)(A1) (C2)

Note: (A1) for all correct heights, (A1) for all correct end points (39.5, 49.5 etc.).

Histogram must be drawn with a ruler (straight edge) and endpoints must be clear.

Award (A1) only if both correct histogram and correct frequency polygon drawn.

(b) 44.5 (A1) (C1)

(c) Mean = (M1)

Note: (M1) for a sum of frequencies multiplied by midpoint values divided by 42.

UP = 58.3 kg (A1)(ft) (C2)

Note: Award (A1)(A0)(AP) for 58.

(d) Standard deviation = 8.44 (A1) (C1)

Note: If (b) is given as 45 then award

(b) 45 (A0)

(c) 58.8 kg (M1)(A1)(ft) or (C2)(ft) if no working seen.

(d) 8.44 (C1)

[6]

4. (a) 9 (A1) (C1)

(b) 12 (A1) (C1)

(c) $8 + 3 + 9 + 6$ (M1)
 $= 26$ (A1) (C2)

Note: Award (A1) for 20 seen if answer is incorrect.

(d) $5 + 2 + 3$ (M1)
 $= 10$ (A1) (C2)

Note: Award (A1) for 29 or 19 seen if answer is incorrect.

[6]

5. (a) 0.965 (A1) (C1)

(b) $y = 1.15x + 0.976$
(A1) for 1.15x (A1) for +0.976 (A1)(A1) (C2)

(c) $y = 1.15(7) + 0.976$ (M1)
Chemistry = 9.03 (accept 9) (A1)(ft) (C2)

Note: Follow through from candidate's answer to (b) even if no working is seen. Award (A2)(ft).

(d) the correlation coefficient is close to 1
OR strongly correlated variables
OR 7 lies within the range of physics marks. (R1) (C1)

[6]

6. (a) (i) H_0 = wearing of a seat belt and the time a driver has held a licence are independent. (A1)

Note: For independent accept "not associated" but do not accept "not related" or "not correlated"

(ii) 2 (A1)

(iii) = 22.05 = 22 (correct to the nearest whole number) (M1)(A1)(AG)

Note: (M1) for correct formula and (A1) for correct substitution. Unrounded answer must be seen for the (A1) to be awarded.

(iv) $\chi^2 = 8.12$ (G2)

*Note: For unrounded answer award (G1)(G0)(AP)
If formula used award (M1) for correct substituted formula with correct substitution (6 terms) (A1) for correct answer.*

(v) "Does not accept H_0 " (A1)(ft)

< 8.12 or p -value < 0.05 (R1)(ft)

Note: Allow "Reject H_0 " or equivalent. Follow through from their χ^2 statistic. Award (R1)(ft) for comparing the appropriate values. The (A1)(ft) can be awarded only if the conclusion is valid according to the comparison given. If no reason given or if reason is wrong the two marks are lost.

(b) (i) (= 0.49, 49%) (A1)(A1)(G2)

Note: (A1) for numerator, (A1) for denominator.

(ii) (= 0.333, 33.3%) (A1)(A1)(G2)

Note: (A1) for numerator, (A1) for denominator.

(c) (i) = 0.239 (23.9 %) (A1)(M1)(A1) (G3)

Note: (A1) for correct probabilities seen, (M1) for multiplying two probabilities, (A1) for correct answer.

(ii) $1 - = 0.741$ (74.1 %) (M1)(M1)

(A1)(ft)(G2)

Note: (M1) for showing the product, (M1) for using the probability of the complement, (A1) for correct answer. Follow through for consistent use of with replacement.

OR

= 0.741 (74.1 %)

(M1)(M1)

(A1)(ft)(G2)

Note: (M1) for adding three products of fractions (or equivalent), (M1) for using the correct fractions, (A1) for correct answer Follow through for consistent use of with replacement.