AQA

GCSE

STATISTICS

8382/1H: Paper 1 Higher
Report on the Examination

8382
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General

This was Paper 1 for the Higher Tier in the first sitting of the new GCSE Statistics specification. Students showed good knowledge throughout the paper and seemed comfortable, in many cases, with the increased emphasis on interpretation and analysis. Questions appeared to be accessible and there appeared to be no time issues as attempts at the last question were as proportionately high as any others.

Topics which were done well included:

- Population pyramids
- Venn diagrams
- Drawing histograms
- Identifying and calculating averages
- Sampling

Topics which students found difficult included:

- Interpreting Spearman's Rank Correlation Coefficient
- Formulae for conditional probability
- Properties of a normal distribution

Question 1

This part was well answered.

Question 2

This part was very well answered.

Question 3

This part was well answered. The most commonly selected incorrect response was 'independent'.

Question 4

This question appeared challenging to many students and was not well answered suggesting that the notation used in the question was unfamiliar to many.

Question 5a

This part was well answered. The most common incorrect response was '92%' which was not awarded any marks.

Question 5b

This part was quite well answered, with the majority of students being awarded at least one mark. The reasons stated were many and varied although most students correctly identified that students were likely to be dishonest when responding or unlikely to respond if they did work more than 6 hours. The most common incorrect response was to state that 25% did not answer with no attempt to explain why this would change the result.

Question 6a

This part was well answered. The two most successful approaches were either to realise that 1.6 pentagons equalled 24 or to use the value of 15 given and use this to calculate the number of nest boxes in the two woods and then show the difference was 24. Students awarded a single mark usually used the latter method and incorrectly evaluated one of the values.

Question 6b

This part was quite well answered with most students being awarded at least one mark. A number of students failed to look at the proportion of occupied nest boxes and simply read off frequencies from the bar chart. Students awarded 2 marks had either made an arithmetic error and as a result only correctly calculated one of $\frac{11}{102}$ and $\frac{9}{81}$ or correctly calculated both fractions but failed to write them in comparable forms. Students are reminded of the need to show all calculations.

Question 6c

This question was quite well answered with the majority of students scoring at least one mark. Students who obtained an initial value of 240 were usually successful in gaining all 3 marks. There was a mark available to students who did not start with a correct value for finding 10% of their value and then subtracting 20 from this. However, many students rounded their answer during the calculation and so did not gain this mark. A number of students obtained a fully correct solution but made an error when completing the diagram such as changing the width of the bar.

Question 7a

This part was very well answered.

Question 7b

This part was not well answered although most students were awarded at least one mark. Many students failed to work with percentages, instead choosing to work with the number of males and females. This approach could only gain a single mark.

Question 8a

This part was very well answered. Many students included response boxes which were not asked for in the question. The common errors were not asking about travel to school or asking a question about a specific form of transport.

Question 8b

This part was well answered, with almost all students gaining at least one mark. Most students correctly showed that there were 30 students questioned and that 10% of 30 was 3. For the second part of the question, most of the correct responses talked about samples.

Question 8ci

This part was quite well answered. The most common incorrect response involved students referring to 'number of passengers' rather than 'passenger kilometres'. Many correct answers referred to the increase possibly being due to an increase in vans and taxis.

Question 8cii

This part was not well answered. Most correct responses referred to a possible increase in the number of roads. Many incorrect answers referred to the 'number of passengers' or people driving further on each journey.

Question 8d

This part was quite well answered, with most students gaining at least one mark. Many responses consisted of 2 contradictory statements which were only awarded a single mark. Many answers also incorrectly referred to the 'number of passengers'.

Question 8ei

This part was very well answered with most students being awarded both marks. Common errors were not to show the division by 12 or incorrectly evaluating the division (even though the answer was stated in the question).

Question 8eii

This part was quite well answered. Common errors were to state that the mean should be used but the 387 should be ignored or that it was inaccurate.

Question 8eiii

This part was not well answered. Although the majority of students were awarded at least one mark, few achieved all 3 marks. Many students correctly choose the median and mode and commented on the effect of the outlier on these measures but few could give a correct reason as to why the mode was not suitable in this case.

Question 8f

This part was quite well answered. The most common incorrect response was 'asking her friends'.

Question 8g

This part was quite well answered. Many students incorrectly made reference to 'her friends' or stated that the mean she had calculated from their responses was secondary data.

Question 8h

This part was well answered. Incorrect responses stated that she should ask more friends, only ask people who use the train or remove the outliers.

Question 9ai

This part was quite well answered with most students awarded at least one mark. There were a number of different approaches seen which could all gain full marks if correctly evaluated. Most students started by summing each of the rows but surprisingly often they only correctly evaluated one of these. A number of students started by rounding the values first, possibly confused by the meaning of 'estimate' in this case.

Question 9aii

This part was quite well answered. Common incorrect answers were to suggest sampling daily rather than weekly (but with no mention of increasing the number of orders being sampled) or to state that all the orders should be monitored.

Question 9b

This part was quite well answered. The most common incorrect responses were to correctly evaluate both values but not give them in a comparable form or failing to give a statement as to what the values showed.

Question 10a

This part was very well answered.

Question 10b

This part was well answered. Many correct responses referenced that people working at different times of the week might be more affected by the changes rather than the part-time workers being likely to be under-represented.

Question 10c

This part was well answered. There were a number of different methods seen for calculating 14.0625 and these often gained both marks. The most common reason for only being awarded a single mark was incorrectly rounding 14.0625 up to 15. Students who failed to gain any marks usually used an incorrect value in their calculations such as 120 instead of 160.

Question 11a

This part was well answered. The most common error was to multiply $\frac{914(000)}{1049(000)}$ by 92 rather than 100.

Question 11bi

This part was well answered. Common errors were to give an answer of '-45.1%' or to compare the years 1910 and 1930.

Question 11bii

This part was quite well answered. Incorrect answers often referred to some type of correlation.

Question 11c

This part was quite well answered. Most students seemed to realise that there was a reduction of 16.7% but many of the incorrect answers often involved multiplying by 1.167 to try to find the initial value.

Question 12

This part was not well answered although the majority of students were awarded at least one mark. Students who started by calculating the number of births for the different parts of the UK often made an arithmetical error which limited the number of marks available. Many students also chose to compare the number of births rather than the crude birth rates which were required.

Question 13a

This part was quite well answered although a high percentage of students did not attempt this part. A common error seen was to use $n = 20$ rather than 10.

Question 13b

This part was not well answered. Many students did not attempt this part. Many of the incorrect responses did not refer to the answer obtained in part (a) and instead stated that the second performance had much higher marks than the first performance.

Question 14a

This part was well answered.

Question 14b

This part was quite well answered. Almost all the incorrect answers given indicated sample 9.

Question 14c

This was quite well answered and most students were awarded at least one mark. Common errors were failing to mention that the sample mean was outside of the action limits or suggesting that another sample should be taken.

Question 15a

This part was very well answered with most students able to correctly calculate 2 or more frequency densities.

Question 15b

This question was quite well answered. Most students correctly calculated that 18 aircraft had a speed between 90 and 100 mph but many struggled to calculate the number with speeds between 100 and 155 mph, often giving a value of 12.

Question 15c

This proved to be challenging for many students. Students who ticked 'Cannot tell' and were only awarded a single mark usually gave a reason referring to the data being grouped or exact speeds not being known.

Question 16a

This part was not well answered and was not attempted by a number of students. Students did not appear to realise the 'almost all' referred to all the data being within 3 sd of the mean. This is stated in the teaching guidance. Some students worked 2 sd and they usually were awarded one mark.

Question 16bi

This part was not well answered although most students gained at least one mark. Many responses failed to link this part to part (a) so could only be awarded a single mark for calculating the standardised score for females. Some students calculated both standardised scores correctly but selected females because the answer was positive rather than being closer to zero. This response was only awarded two marks.

Question 16bii

This was not well answered. The most common incorrect answer was to state that the bone might have been broken or decayed while it was in the ground.

Question 16c

This was not well answered. The majority of students selected curve A.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the Results Statistics page of the AQA Website.