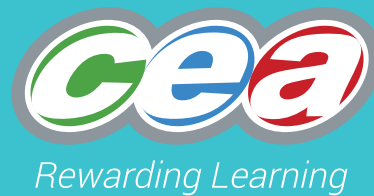


GCSE



Chief Examiner's Report Statistics

Summer Series 2018



Foreword

This booklet outlines the performance of candidates in all aspects of CCEA's General Certificate of Secondary Education (GCSE) in Statistics for this series.

CCEA hopes that the Chief Examiner's and/or Principal Moderator's report(s) will be viewed as a helpful and constructive medium to further support teachers and the learning process.

This booklet forms part of the suite of support materials for the specification. Further materials are available from the specification's microsite on our website at www.ccea.org.uk.

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GCSE STATISTICS

Chief Examiner's Report

Assessment Unit 1: Foundation Tier

This was the first set of examinations for the newly-introduced specification in GCSE Statistics. Whilst no awards are available until Summer 2019, the unitised assessment structure allowed a small number of centres to enter pupils for the first of their two units. It was very encouraging to note some of the excellent responses which were seen by examiners at both tiers. Candidates had been prepared well for the examination and were able to demonstrate the breadth and depth of their statistical knowledge.

When answering questions requiring mathematical manipulation, candidates are strongly advised to show their working as marks can be awarded for the correct application of a method, even if the final answer is incorrect. Candidates should use the number of marks available for a question to guide them in deciding how much working is required. Furthermore, candidates should be encouraged to use a ruler when drawing diagrams, such as box plots, and when taking readings from, for example, a cumulative frequency diagram. This was a source of several lost marks in both papers.

In questions addressing Assessment Objective 1, which required candidates to perform standard routines, such as drawing a pie chart or calculating an index number, responses were generally very good and candidates were able to obtain many of the available marks. However, questions requiring the interpretation of statistical information (AO2) and those requiring a critique of statistical methodology (AO3) were not as well answered and it was clear that candidates would benefit from more practice in these types of questions. Some possible responses to this year's questions are included in the Mark Schemes but these are by no means exhaustive. Centres should be aware that all suitable responses will be credited. It is important to note that an understanding of the various components of the Statistical Enquiry Cycle is fundamental to the GCSE Statistics specification and the examination questions will reflect this.

- Q1** This was a straightforward opening question and candidates had no difficulty with the pictogram in Parts (a) and (b). Very few answered Part (c) correctly as candidates tended to focus on the aesthetics of the symbol rather than the fact that the proposed one did not have a line of symmetry.
- Q2** Candidates found this question easy and responses were, without exception, excellent.
- Q3** Parts (a) and (b) were very well answered. Answers to Part (c) were mostly incorrect as candidates did not see that the question specified that a girl had been chosen at random. Part (d) was poorly answered and many candidates did not seem to know how to handle expected frequency.
- Q4** Answers to this question were generally very good. In Part (a) candidates need to be careful with how they express their answers: 'the town' was not an acceptable response. Similarly, the reasons given in Part (c) were not as well expressed as they could have been, making it very difficult for examiners to award marks. The reasons required for Part (b) were good, though some candidates thought that the responses '6 – 10' and 'More than 10' overlapped. This error was made by candidates on the Higher Tier paper too.

- Q5** Part (a) was very well answered with only a very small number of candidates forgetting to complete the Key. Finding the median and range for Part (b) caused some difficulties for some candidates. Many gave the location of the median instead of the median itself (8 or 8.5 were frequently seen). For the range, candidates should know to actually do the subtraction: $41-3$ was sometimes left uncalculated. Being worth only 1 mark each, the comparisons in Part (c) were well made.
- Q6** Candidates found this question difficult. Majority were unable to convincingly identify the correct median and quartiles from the cumulative frequency diagram in Part (a). Some candidates did manage to draw a box plot for Part (b) and correctly identified the skewness. Hardly any candidate knew what opportunity sampling was for Part (d).
- Q7** This question was based on a scatter diagram and candidates demonstrated very good understanding of this topic.
- Q8** Part (a) was very well done. For Parts (b) and (c) candidates seemed unfamiliar with relative frequency and, consequently, were unable to give creditworthy answers. For Part (c), many suggested that the coin should be changed, indicating no real understanding of the scenario.
- Q9** Answers to Part (a) were good but were not always expressed clearly. Those candidates who had learned how to estimate the mean from a grouped frequency table had no difficulty in getting all of the marks in Part (b) but there were numerous errors from others. The quality of response to Part (c) varied with some being very good and others being totally incorrect, even when Part (b) had been answered correctly. Candidates need to know how to interpret results in context and responses to this Part indicated that this is a weakness. Responses to Part (d) indicated that hardly any candidate knew what a histogram for normally distributed data should look like. Performance in this question was much stronger in the Higher Tier paper.
- Q10** This question was generally well answered. Candidates need to be reminded about appropriate use of rounding. In Part (a) many candidates correctly worked out the mean to be 5.5 then inappropriately rounded it to 6 for the answer. Answers to Parts (b), (c), (d) and (e) were very good. Responses to Part (f) were weak and candidates tended to think that the negative value of the product moment correlation coefficient implied that the hypothesis should be rejected.
- Q11** Answers to this question were very good. Interpretation and drawing of pie charts in Parts (a) and (c) proved to be very accessible. Calculation of the percentage in (b) was less successful with the errors being relatively minor, such as forgetting to multiply by 100. Most candidates noticed the open-ended class in the frequency table so Part (d) was well answered.

Assessment Unit 1: Higher Tier

- Q1** Candidates had little difficulty in extracting the required information for Parts (a) and (b) from the given table, though many responses to Part (c) were based on the candidates' general knowledge rather than their interpretation of the information in the table.
- Q2** This question was generally well answered, though a number of candidates did not include appropriate response boxes in Part (a). In Part (b), some candidates answered in the context of their response to Part (a) rather than generally as required by the question.
- Q3** Candidates were able to make simple comparisons between the medians shown in the box plots but very few commented on the interquartile range or what its value implied. Varying levels of engagement with the scenario in the question were evident.

- Q4** Candidates correctly identified a disadvantage to using a grouped frequency table in Part (a) but were, surprisingly, unable to provide an appropriate advantage. This question appeared on the Foundation Tier paper too, where candidates tended to score better. However, responses to the remaining Parts this question were very good on this paper whereas they were of a much lower standard on the Foundation Tier paper.
- Q5** Part (a) was very well answered but a common error in Part (b) was to claim that the responses '6–10' and 'More than 10' overlapped. This error was made by candidates on the Foundation Tier paper too.
- Q6** Candidates were able to complete the frequency tree in Part (a) with little difficulty and the probability required for Part (b) posed no problems. Part (c) proved difficult for most candidates with many unable to extract the correct numbers from the tree diagram. Most incorrectly considered all passengers rather than just those going on holiday.
- Q7** Candidates' responses to most parts of this question were very good. The main source of lost marks was in Part (f) where candidates were unable to fully describe the significance of the value of the product moment correlation coefficient given in the question.
- Q8** Candidates demonstrated a good understanding of the vocabulary and form of control charts and were able to answer Parts (a) to (c) with very little difficulty. In Part (d) many candidates only partially described the action the production manager would have taken.
- Q9** The histograms in Part (a) were well drawn and most candidates were able to give one correct reason in Part (b). However, most found it harder to phrase a second correct reason.
- Q10** Calculating and plotting the moving averages and drawing the trend line were very well done by almost all candidates. In Part (e) candidates found executing an estimate with the trend line difficult and very few correct answers were seen.
- Q11** Parts (a) and (c) of this question were well done by almost all candidates, but in Part (b) candidates did not always give an accurate interpretation of the 50.6 in the equation of the line. Fully correct answers to Part (d) were given by only the strongest candidates. Some candidates gave values of Spearman's rank correlation coefficient outside the range $|r_s| \leq 1$. Even when correct, candidates were not always able to connect their answer to Part (d) to Anna's claim in Part (e).
- Q12** While candidates did demonstrate a good understanding of index numbers in Parts (a) and (b), most found parts (c) to (e) very challenging. Part (d) involved some problem-solving and most candidates were unable to represent the information given in the question.
- Q13** Those candidates who were able to recall the procedure for finding standardised scores made very good progress in this question. Some were unable to gain any marks.

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