
GCE STATISTICS

SS02 Statistics 2
Report on the Examination

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General

The level of computational skills remains good and, where a calculator is used, students generally demonstrate their understanding of the underlying processes. The quality of explanations needs improvement and these should always be in context. Students should avoid using a pronoun, 'it' or 'they', but state exactly what they are referring to in the sentence. Frequently responses suggested that students had not fully read the introduction to the question, sometimes with unfortunate consequences.

Question 1

For many students this was a straightforward start to the paper and earned them full marks. Few had problems with (a)(i) but (a)(ii) proved more difficult with many treating 'at least' as if it had been 'at most'. Part (b) was generally well done. Though many correctly worked with a total of 6 in part (c), others ignored the word 'total', despite it being printed in bold, and simply used 3.4. Others compared the patients treated by Chris with those treated by Zubar, showing that the first sentence of the stem had not been absorbed.

Question 2

The hypotheses were generally well expressed in terms of μ . There was much confusion over the signs of the test statistic and the critical value. Frequently the critical value was stated as ± 1.2816 (sometimes with two-tailed diagrams) or simply 1.2816, and the actual calculated sign of the test statistic was ignored. The implication is that a test statistic of 1.42 would also have resulted in rejection of H_0 (as indeed usually happened when the test statistic had been incorrectly calculated as positive). Students who stated the critical value before calculating the test statistic generally avoided any such confusion. In part (b) most handled the 5 gram correction correctly, although some added it to the mean, while others subtracted 30 grams from the mean. Type I and Type II errors continue to confuse many students and should always be stated in the context of the question.

Question 3

Most students found the mean successfully. A significant proportion did not understand the significance of 'Show that ...', quoting $E(X^2) = 8119$ with no indication of how this number had been obtained. Only a small number of students correctly completed (a)(iii), while others reached 0.25 then stopped and a large number omitted this part completely. Most correctly chose 'increase' and 'increase' for part (b) although a surprising variety of answers was also given. In part (c) it was common for a student to get some way towards a correct explanation, but the overall quality of explanations remains poor.

Question 4

Most students correctly identified this as being a 3-point moving average, although 13 was also popular. Strangely, a significant proportion omitted to plot the missing moving average on the graph, as requested. The seasonal effect and forecast were generally well done, although some of the answers to (b)(iii) suggested that a forecast was never valid. A pleasing number recognised in part (c) that it was the deviation from the pattern which was important, while others simply picked the highest and lowest values.

Question 5

Many students ignored the context and the information given in this question. In part (a), the majority started 'Number the sections 00 to 89...' and did not relate these numbers to the already stated 1 to 90. Others used 01 to 15, or 00 to 14. For the disadvantages, totally inappropriate text-book quotations were often presented, with much reference to 'time-consuming' and 'expensive', although some students appreciated the context and gave thoughtful and practical answers. In part (b) most recognised 'systematic' but thought that this would be random and would not be stratified. In questions like this, students must realise that a clear yes/no is required, rather than 'only partly random'. Part (c) was answered reasonably well, although 'cheap' appeared frequently and answers such as 'every person is not equally likely to be picked' showed lack of engagement with the context.

Question 6

Parts (a) and (b) were generally well done, although, inevitably, many omitted the 'thousand' from the final answer, while others thought that this could be accommodated by adding three zeros at the end of a figure containing a decimal point. In part (c), it was common for the 2.2 to be ignored, but the pie chart aspect was well handled. Most treated the diagrams in part (d) as time series, getting the reverse of the correct answer, but there were a pleasing number of good explanations of the correlations. Students should realise that failure to give a reason, when asked for one, will severely limit the marks available.

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