



**General Certificate of Education (A-level)
January 2012**

Statistics

SS02

(Specification 6380)

Statistics 2

Report on the Examination

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General

The majority of candidates were well drilled in the standard procedures, especially hypothesis testing and the use of moving averages. Sometimes potentially good solutions went awry through lack of attention to detail in reading the question. Candidates should make sure they frame their answers in terms of the context of the question.

Question 1

This was generally well answered, although a surprising number of candidates gave the $P(X \leq 2)$ value in part (a) for the probability of fewer than 2. Some candidates seemed to confuse 'three significant figures' (the general instruction on the front of the paper) with 'three decimal places' when giving the answer to part (b). In part (c), use of $1 - P(X \leq 14)$ was the only common error. The final part proved most difficult. Candidates should realise that 'explain' requires a feature of the context linked to a feature required by the Poisson distribution. For example, 'Tyres are often bought in sets of four, so sales are not independent' is brief but conveys the correct concepts, while 'Poisson is unlimited' may be a true statement but says nothing about the context of this question.

Question 2

Part (a), the mechanical part of the question, was generally very well done, but the remaining, interpretative, parts less so. The relationship of the test statistic to the critical value needed to be demonstrated, and some omitted this. Part (b) suggested that the definitions of Type I and Type II error were well known, but not necessarily which applied in this case. In part (c), only a small proportion appreciated that the small sample size precluded the use of the CLT here. Small sample size was the commonest answer in part (d), with candidates not realising that this has already been accounted for in the use of $\sqrt{10}$ earlier. Few seemed willing to call into question the reliability of a website.

Question 3

The calculation of the mean and standard deviation were well done, and nearly all candidates correctly found the value of k . There were many ingenious, but incorrect, ways of obtaining the given answer in part (a)(ii). What was more surprising was that a high proportion of those who correctly completed this part failed to apply the same method in part (b)(ii). The final explanations revealed that few candidates had grasped the concept of an expectation. Even those who had done all the calculations correctly tended to suggest, along with the majority, that the disadvantage was in the manager missing out on a larger profit, rather than realising that the disadvantage is essentially in the disappointing of customers.

Question 4

The majority scored well on this question, particularly on parts (a)(i) and (a)(ii), although about a quarter did not notice that the figures were in thousands. Many still do not appreciate that giving data to the nearest thousand can introduce rounding errors. Most coped well with the changing trend of the widowed females, but, strangely, many had the peak in 1991. Many candidates handled the proportion of widowed males well, but others were totally baffled by this request, or simply ignored it and commented on the raw numbers. Careful reading is required to distinguish between 'the proportion of males who are widowed', as asked, and 'the proportion of widowed who are male' or 'the proportion of the population who are widowed males'. The final part of the question, on the pie diagram, was generally well done, the commonest error being to give the answer in percentages rather than degrees.

Question 5

The vast majority of candidates were highly competent at calculating moving averages and plotting these to draw a trend line. Most also went on to calculate the seasonal effect and use it and the trend line to predict the Thursday day value. Although many recognised that their prediction was not accurate, fewer noticed that the day's pattern had changed.

Question 6

Many candidates reeled off a rote answer without fully taking account of the context of this particular question. A large number of answers started 'Number the animals 000 to 499...', despite the question stating that the animals were already numbered 001 to 500. Nevertheless, there were many good answers to part (a). Most recognised a systematic sampling method, and that it did not give a truly random sample because 'not every subset can be chosen'. Often, further explanation showed that the meaning of this set phrase was well understood. Many candidates had little or no idea what a quota sample involved, and often confused this with a cluster sample. In the final part, those who had some knowledge of a quota sample sometimes talked of 'interviewers', again regurgitating a standard answer and ignoring the context. Others simply said that this method was not random, with no indication as to why this would be a disadvantage.

Mark Ranges and Award of Grades

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