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**General Certificate of Education (A-level)**
**January 2011**

# Statistics SS04

# (Specification 6380)

# Statistics 4

# *Report on the Examination*

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## General

More candidates than in the past used graphics calculators to obtain answers directly. This was usually successful in the case of confidence intervals, but less so for hypothesis tests, where candidates were not always clear what comparison to make, sometimes comparing a $p$-value with a critical value or similar. It was good to see nearly all candidates expressing their conclusions to hypothesis tests in context. The confidence intervals in questions 1 and 2 were usually correctly calculated, often directly from a graphics calculator. Very few of those who used graphics calculators gave incorrect answers, but those who did suffered a severe penalty. Many obtained the answers directly but provided some supporting work. This was fine except for those candidates who provided incorrect expressions (usually an incorrect $t$ or $z$-value) followed by the correct answer.

## Question 1

Part (b) was well answered, with many candidates realising that, because the interval contained 0.5, there was no significant evidence for or against the claim. Others pointed out that 0.5 was very close to the upper limit of the interval — another good point.

## Question 2

Part (c) was quite well answered, but most candidates missed the point that only one species of rodent on one island had been investigated and so Olivia's claim was far too general. Some candidates commented on the different sample sizes, which was not relevant to Olivia's claim.

## Question 3

This question was generally well answered, with most candidates expressing their conclusions in context. In part (b), the most popular answer was that cyclists might arrive in groups and so the events would not be independent. A variety of other valid answers were available, but the minority who thought that the values of $n$ and $p$ made the binomial inappropriate received no marks.

## Question 4

All parts of this question were well answered. The most common error was to use $z$-values instead of $t$-values. A minority used $p$-values, but this often led to invalid comparisons.

## Question 5

Part (a) proved surprisingly taxing, with many candidates either omitting or making an incorrect attempt at a continuity correction. Part (b) was generally well answered. Unusually, candidates appeared to have more problems with the normal approximation in part (c) than with the exact test in part (b). Using $\sqrt{33}$ for the standard deviation was one of the more frequent errors. There were many good answers to part (b)(iii), but a minority confused Type I and Type II errors.

## Question 6

Most candidates picked up marks in part (a) but part (b) proved remarkably demanding even to those who had answered part (a)(iii) correctly. Part (b)(ii) also caused problems, with only a minority able to find correctly the standard deviation of $T_5 - 0.5Y$.

## Mark Ranges and Award of Grades

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