A-LEVEL
STATISTICS

SS05 – Statistics 5
Report on the Examination

6380
June 2014

Version: 1.1

Further copies of this Report are available from aqa.org.uk

Copyright © 2014 AQA and its licensors. All rights reserved.
AQA retains the copyright on all its publications. However, registered schools/colleges for AQA are permitted to copy material from this booklet for their own internal use, with the following important exception: AQA cannot give permission to schools/colleges to photocopy any material that is acknowledged to a third party even for internal use within the centre.

General

This was an accessible paper and the majority of students seemed well-prepared. Students were able to complete the paper in the time allowed. Generally, working was clear and students often gave full and thoughtful responses in context when interpreting their answers. There were some scripts, however, which lacked clarity and students must be encouraged to use black ink for all their working.

Question 1

This question was a test for a normal population standard deviation and the majority of students handled the test well. There were errors in setting up the null hypothesis, the most common of which was to write $\sigma^2 = 30$. Errors also occurred in calculating the test statistic; some students had difficulty in applying the correct formula while others went on to take the square root of their calculation. Finally, a considerable number of students failed to appreciate the need to set up their critical region using both the upper and the lower χ^2-values.

Question 2

This was a standard application of a z-test for a given difference in two normal population means. This test was handled well, with the majority of students gaining full marks in both parts of the question. Part (a) caused the most problems as some students struggled with expressing the inequality in mathematical notation. It was also important to identify clearly between the samples, with an appropriate suffix or clear labelling.

Question 3

This was a question on the rectangular distribution. Part (a)(i) was generally completed successfully although there was some confusion over variance and standard deviation. Parts (a)(ii) and (b) caused more difficulty. A clear, well-labelled diagram of the probability distribution function would have been of use to those students who struggled with the interpretation of the question in part (a)(ii). It was surprising to see many students resorting inappropriately to a normal distribution for their answer to part (b).

Question 4

The constructions of the two confidence intervals in parts (a) and (b) were done successfully by the majority of students. The interpretation in part (c) proved more challenging. Students needed to comment on the values 515g and 5g specifically with reference to the intervals found in parts (a) and (b) respectively, and then to make a comment in context related to Ahmed's packing .

Question 5

This question was a test for equality of two normal population means with unknown variances. Part (a) tested whether the samples came from populations with equal variances and part (b) was the test for equality of the means. The final part of the question tested the students understanding of the context of the question. The majority of students handled the first two parts of the question well, with many gaining full marks. It was important to identify the two samples clearly and to work with a high degree of accuracy. There were many commendable answers to part (c) even from those students who struggled with the statistical tests.

Question 6

This question proved to be the most challenging of the questions on the paper. Part (a) was a straight-forward application of a Poisson distribution and candidates generally handled this part of the question well. Part (b) was a goodness-of-fit test to an exponential distribution with a given mean. Many candidates failed to realise that being given a value for the mean meant that degrees of freedom were only 1 less than the number of classes. Working with the parameter $\lambda = \frac{1}{7.5}$ or $\frac{2}{15}$ did not appear to be straightforward and many candidates resorted to decimals . Accuracy then became an issue as it was necessary to use $\lambda = 0.1333$ or better to obtain the correct answer for X^2. Further errors were caused by some candidates confusing the probability density function for the exponential function given in the formula book with the cumulative distribution function needed to calculate the relevant probabilities. There were many correct answers to part(c) demonstrating that candidates generally knew and appreciated the links between the Poisson and the Exponential distributions.

Mark Ranges and Award of Grades

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

Converting Marks into UMS marks

Convert raw marks into Uniform Mark Scale (UMS) marks by using the link below.

UMS conversion calculator www.aqa.org.uk/umsconversion