

Examiners' Report/
Principal Examiner Feedback

Summer 2012

GCE Statistics S4 (6686) Paper 01

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Introduction

Candidates found this paper very accessible and scored well. They were able to make a reasonable attempt at the majority of questions with some excellent scripts submitted from a number of centres.

Presentation of their answers and the use of good notation were areas that need to be improved together with the giving of conclusions in context. This being said it was pleasing to see some very good scripts.

Report on individual questions

Question 1

The question proved to be a friendly starter for the majority, with many candidates gaining full marks. The most common errors were made in part (a) where they omitted to give the hypotheses and, although they knew something was normally distributed, few said it was the differences that were normally distributed. A minority of candidates did not answer the question.

Question 2

Part (a) of this question was generally very well answered. Weaker candidates sometimes got confused over the hypotheses, writing $H_0: \mu_F = \mu_M$ and $H_1: \mu_F > \mu_M + 5$, and consequently muddled the conclusion demonstrating a misunderstanding of what they were testing.

Part (b)(i) was poorly answered. The main error was that candidates appear to have assumed that they must use an S4 technique and used the t -distribution rather than the normal. The candidates are required to know the material from S3 and should be able to select the appropriate distribution to use. The main error in part(ii) made by the candidates who had not given up after part(i) was to use 0.9 as the variance instead of 0.225.

Question 3

The candidates found this question very much to their liking and only a few of them did not gain most of the marks. Common errors were to use the incorrect critical region and to not say what differed in variability in the conclusion.

Question 4

The majority of candidates gained full marks for part (a) and part (b). In part (c) many candidates simply used 0.7 and stated it was not in the interval rather than use 0.49.

Question 5

The majority of candidates gained full marks for part (a) and (b). In part(c) many candidates mentioned that something had to be normally distributed, usually "it", but were not clear as to what need to be normally distributed.

Question 6

The majority of candidates were able to show that they understood the proofs needed in parts (a) and (b) but in many cases the presentation was poor. In future series this may be penalised and it is recommended that candidates include every step in their proofs and explain carefully the steps they take. In part (c) the inequalities were in fact easy to solve but many candidates were put off and unable to make a start. The most common errors made by those able to make progress were to get to $\frac{m}{n} < \frac{7}{3}$ and then decide $\frac{n}{m} < \frac{3}{7}$ or to not combine their solutions into one statement.

In part (d) many candidates started again and substituted 20 and 60 into the variances. Whilst many were able to then draw the correct conclusion it was surprising how many candidates thought that $\frac{31}{1500}$ was less than $\frac{1}{60}$ and hence incorrectly stated that \hat{p}_3 was the best estimator as it had the smallest variance. The candidates who used part (c) to answer part (d) provided some very neat explanations as to why \hat{p}_2 was the best estimator.

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