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Examiners' Report/ Principal Examiner Feedback

Summer 2013

GCE Statistics S4 (6686)
Paper 01R

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Introduction

Overall the paper worked well enabling candidates to demonstrate what they knew but also allowing the stronger candidates to show their true potential. Most candidates found questions 1, 2, 3, 4 and 6 accessible with many scoring highly here.
Questions 7 and 8 proved to be good discriminators and only the better candidates made significant progress through these.

Report on individual questions

Question 1

This question was a relatively easy introduction to the paper. Many candidates were able to gain full marks. The most common error was in part (b) with the Lower critical value where candidates realised they needed to look up $F_{4,\ 6}$ but did not find the reciprocal of it.

Question 2

This was answered very well and most scored full marks.

Question 3

Parts (a), (c) and (d), were well answered. In part (b) a minority of candidates did not write down an expression in terms of probabilities. As this is a 'show that' question it is important that this stage is included in the working. Simply writing down the given answer multiplied out is not enough to gain the marks. In part (e) the most common error was to state $\lambda > 3$ as this was the closest whole number and not the value from the graph.

Question 4

The candidates found this question very much to their liking and only a few of them were unable to attempt all parts. In part (a) The most common error was in (ii) where the candidates simply found the unbiased estimate s_B^2 using the 6 pieces of data seen even though the question gave a hint not to do this by saying there were 9 pieces of data. It was clear from part (b) that most candidates knew what was expected and only lost the A marks when they had made an error in part (a). Part (c) of this question was generally very well answered. Weaker candidates ignored the 0.9 and tested the hypotheses H_0: $\mu_B = \mu_A$ and H_1: $\mu_B > \mu_A$.

Question 5

The question proved to be popular with many candidates gaining full marks. Only a few used a 2 sample *t*-test rather than a paired *t*-test. The main error was to find the standard deviation rather than the unbiased estimate.

Question 6

In part (a), many candidates carried out the test correctly with only a few not writing their conclusion in the context of the question. In part (b) most candidates realised that the Chi squared distribution was required and gained full marks.

Question 7

This question was tackled with various degrees of success. Part (a) was done well but part (b) caused more problems particularly for the weaker candidates. Those who managed to find a second equation correctly then had difficulty in solving it.

Question 8

This question proved to be challenging for many candidates. In part (a) the majority of candidates gained the B mark but then assumed

$$\mathrm{E}\left(\sum_{i-1}^{n} W_i^2\right) = \mathrm{Var}\left(\sum_{i=1}^{n} W_i^2\right) + \left[\mathrm{E}\left(\sum_{i=1}^{n} W_i^2\right)\right]^2$$

Only a minority of candidates found $\mathrm{E}(W_{\mathrm{i}}^2)$ and then used $\mathrm{E}(W_1^2 + W_2^2 + \ldots + W_{\mathrm{i}n}^2)$.

In part (b) the most common error was to not show that $\mathrm{E}\left(\frac{1}{n}\sum_{i=1}^{n} W_i^2\right) = \mu$.

Part (c) was only attempted by the best candidates. Few candidates realised that $\frac{1}{n}\sum_{i=1}^{n} W_i^2 = \overline{w}$ and then went on to use $\mathrm{Var}(\overline{w}) = \mathrm{E}(\overline{w}^2) - [\mathrm{E}(\overline{w})]^2$.

Of those candidates who managed to get the right answer in part (c) only a minority were able to write down an unbiased estimator of σ^2 .

Grade Boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:
http://www.edexcel.com/iwant to/Pages/grade-boundaries.aspx

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