Examiners’ Report/
Principal Examiner Feedback

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GCE Statistics S4 (6686) Paper 1
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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, 3 and 4 accessible with many scoring highly here.

Question 6 proved to be a good discriminator and only the better candidates made significant progress through these. Generally candidates were able to carry out calculations but showed a lack of understanding when they had to use or interpret the answer to their calculations.

The presentation of the work was poorer than in previous years. Candidates need to show all their working so they can be awarded the method marks when they make a careless slip in the calculation.

Report on individual questions

Question 1

This question was a relatively easy introduction to the paper. Many candidates were able to gain full marks.

Question 2

This question was answered poorly. Many candidates were able to calculate the pooled estimate of variance but then went on and used the formula for the confidence interval for the variance of a single sample.

Question 3

The majority of the candidates recognised the need to use a paired \( t \)-test with only the weaker ones using a test for two means. The hypotheses were not always correctly specified even though the correct test was carried out and some candidates did not give their conclusion relative to the context of the question.

Question 4

Parts (a), (b), (c) and (e) were answered well with many candidates gaining full marks. In part (d) few candidates realised that they were required to work out \( P(Y \geq 2) + P(Y = 1) \times P(Y \geq 2) \). Those that did were generally able to reach the correct answer.

In part (d) several candidates were able to say when each test should be used but were unable to draw a correct conclusion for this situation. Only a few referred to the likelihood of the probability being over 0.125 was small so the consultants test should be used in this case.
Question 5

The two tailed $F$ test was usually tackled quite well although there were many calculator errors made when calculating $s_x$.

However, full marks were rarely obtained in part (b) often due to inaccuracies made in using the calculator rather than from using an incorrect method. A pooled estimate of variance $s_p^2$ was required and this was often attempted but the $\sqrt{\frac{1}{6} + \frac{1}{5}}$ term sometimes divided into $s_p$ rather than multiplying it. The interpretation in part (c) was often answered well and the follow through enabled those who could interpret the statistics to gain some credit.

Question 6

Many candidates were able to fully correct easy to read solutions to this question whilst others were unable to start.

The main errors made were in part (d) where many candidates did not consider both $E(Y)$ and $\text{Var}(Y)$ when deciding whether $Y$ was a consistent estimator and in part (g) where many candidates used the mean of the values rather than the maximum.

Question 7

Part (a) was answered well with many correct solutions. In part (b) many students were unable to differentiate between the two tests. Whilst they usually had the correct critical value for each they generally used the same value for the standard deviation. More often than not this was the unbiased estimate.

Part(c) was poorly done. The few candidates who got different conclusions in part (b) generally had some idea that the normal distribution should be used. However those who had the same conclusion basically rewrote their conclusion to part (a) and (b) with no reference to which test was best.