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Examiners' Report

Summer 2015

Pearson Edexcel GCE in Statistics S4 (6686/01)

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Mathematics Unit Statistics S4

Specification 6686/01

General Introduction

Students 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. The presentation of the work was generally good and students were able to complete the paper within the time.

Report on individual questions

Question 1

Most students carried out a paired *t* test, although a minority chose to do a difference of means test even though the question stated which test to use. The method was well known and clearly demonstrated. In part (b) many mentioned that the sales had to be normally distributed. Whilst this is a sufficient condition the required answer was that the differences in sales was normally distributed.

Question 2

Most realised that the Chi squared distribution was required to establish the confidence interval in part (a) and there were many correct solutions. The most common errors were to not square root their answer at the end or for those who realised they needed the confidence interval for the standard deviation to just use the standard deviation in the formula without square rooting the other values.

Whilst many students realised that they needed to assume a normal distribution in part (b) only a minority said it was the weights which needed to be normally distributed

Part (c) was answered well with most students realising that Fred needed training. Only a few decided that this meant all the employees needed training.

Part (d) was very well answered with most students gaining full marks.

Question 3

Parts (a), (b) and (c) were well answered with the majority of students giving their final answers in context and gaining full marks.

In part (d) most students realised that in order to carry out the difference in means test then the variances needed to be equal. Many did not actually state that this was shown to be not true in part (c). The second most common error was not to answer the question and state which of (b) or (c) was invalid.

Question 4

A minority of students tried to fiddle their answers in part (a). Students who wrote down $\mathrm{P}(X_1 \geq 2) + \mathrm{P}(X_1 = 1) \times \mathrm{P}(X_2 \geq 1)$ or $1 - \left(\mathrm{P}(X_1 = 0) + \mathrm{P}(X_1 = 1) \times \mathrm{P}(X_2 = 0)\right)$ were usually able to proceed through the required steps to complete the proof accurately. Those who chose to start by writing the calculation in terms of *p* were less successful, as they were unclear in their mind what they were trying to calculate.

In part (b) many students did not realise the connection to part (a) and started again. Even those who were unsuccessful in proving part (a) were able to get this part correct by starting from the beginning.

Part (c) proved to be quite a challenge to most students. The most common errors were to work out the number of boxes required rather than the number of eggs or using 0.95 instead of 0.9

Part (d) was well answered with the majority of students gaining the right answer here even if they had struggled with the first 3 parts.

The answer to part (e) was answered eloquently by many students.

Question 5

This was well answered by the majority of students with many gaining full marks. The most common error was to use an incorrect critical value in part (b).

Question 6

The most able students were able to answer this question with ease. The slightly weaker students made a good start and were generally able to do parts (a) and (b). In part (b) many students worked out Var (B) unnecessarily as B was a biased estimator and therefore was not the best estimator.

Part (c) was slightly more challenging with the most common error occurring in rearranging the equation $\frac{1}{k}\left(\frac{7n}{6}\right)=1$ to get $k=\frac{6}{7n}$

Part (d) had mixed responses. Some students just ignored the $2n$ and n. Others used the same variance for X and Y.
In part(e) the most common error was to put their Var(D) < Var(C) even though they had stated that A was the best estimator in part (b). Students who managed to gain full marks in the previous parts of the question were generally able to answer this part accurately.

Grade Boundaries

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

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