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Examiners' Report  
Principal Examiner Feedback

Summer 2024

Pearson Edexcel GCE  
In Statistics (9ST0)  
Paper 03: Statistics in Practice

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## Examiner's report paper 3 A level Statistics 2024

### Overall comments

In general candidates found this paper accessible with questions 1 and 3 being well attempted by most candidates. A common error however was for candidates to be unable to tell the difference between the parameter to be tested and the test statistic.

In addition, many candidates are not forming their Greek symbols for the population mean and median correctly. It is important that candidates are reminded that they need to communicate their ideas clearly to the examiner and if their letter formation is not clear then they risk losing marks. This was a particular concern in questions 2 and 3 where  $\mu$  and  $\eta$  were very similar for many candidates.

### **Question 1**

Many candidates were able to achieve full marks on this question with only a few candidates making errors in selecting the correct lower and upper quartiles from the stem and leaf diagram. The most common loss of marks was for candidates to fail to correctly compare the highest and lowest values from the data set with their bounds for the outliers.

### **Question 2**

This question was well attempted by many candidates with most candidates able to calculate the test statistic correctly and accurately for ANOVA. Common errors were for candidates incorrectly defining their hypotheses. It should be noted that subscripts for multiple parameters should be defined as part of the hypotheses. It is pleasing to see that many candidates are using graphical calculators to perform the longer hypothesis tests however candidates need to be careful to correctly input their numbers otherwise they risk losing a large number of marks.

Some candidates did not know what a blocking factor was and suggested keeping a factor the same for all cats.

Many candidates lost marks for not correctly stating the context of their assumptions. All assumptions for hypothesis tests should be stated in the context of the question.

### **Question 3**

This question was one of the best answered questions on the paper with many candidates able to correctly carry out a Wilcoxon rank sum test. Again, hypotheses were not always well defined and symbols for the population median were not always clear.

### **Question 4**

Question 4 proved challenging for many candidates although the best candidates were successful in all parts of this question.

It was pleasing to see many candidates correctly identifying (b) as the distribution of means which was an improvement on previous years.

In (c) many candidates performed a t-test rather than a z-test and were awarded partial credit.

Many candidates struggled to define a parameter and a statistic and those that did then sometimes did not offer an example in the context of the question.

Candidates should be reminded to read the question fully when giving extended responses.

### **Question 5**

The calculations in question 5 were reasonably well attempted by the majority of candidates however it should again be noted that extended responses should be given in the context of the question.

Again, the importance of reading the question should be emphasised here. Many candidates did not comment on the validity of the model and instead gave answers about other aspects of the question.

### **Question 6**

The context of question 6 was well understood by many of the candidates.

Many of the candidates could not correctly identify the two different sampling methods although the description of simple random sampling using a random number generator was well answered by most.

Surprisingly, (d)(i) was not as well answered as (d)(ii) with the most common incorrect answer being  $\left(\frac{1}{145}\right)^2$ .

Candidates continue to struggle to determine the difference between one and two sample tests of proportion and it would be advisable to spend time identifying population and sample proportions from context.

## **Summary**

Based on their performance on this paper, candidates should be advised to:

- give all explanations in context.
- make sure their answers and any symbols are clearly communicated to the examiner
- keep their working to more than 3 significant figures accuracy, throughout only rounding their final answer.
- use bullet points, each written in clear, specific, and concise sentences for explanation questions

