Principal Examiner Feedback

Summer 2015

Pearson Edexcel Level 2 Award
in Statistical Methods (AST20)

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Principal Examiner Feedback – Level 2

Introduction

There was no evidence to suggest that students had difficulty completing the paper in the given time. Students were able to complete their answers in the spaces provided and many showed intermediate steps in their calculations. Some students did not use a ruler to draw straight lines in question 5. The design of this paper and the performance of students on this paper were consistent with previous papers so allowing a pass mark of about 66% of the total mark to be considered as showing proficiency in Statistical Methods at Level 2.

Reports on Individual Questions

Question 1

Part (a) was answered well by the majority of students. A common error was to use 16 instead of 17 as the highest value. Part (b) was answered well by the majority of students. Common errors included arithmetic errors or finding the median instead of the mean.

Question 2

The vast majority of students answered this question well. Some students mixed up their answers for continuous and discrete and were only able to identify categorical.

Question 3

The vast majority of students were able to score full marks in this question. The common error was to read incorrectly the scale on the y-axis. Some students mixed up their answers for Gold and Bronze.

Question 4

Parts (a) and (b) were answered well by the majority of students. Part (c) was not answered well and many students gave explanations that referred the spinner being biased, even though the question stated that it was a fair 5-sided spinner or that the probability of red and blue was greater than the probability of green.

Question 5

In part (a) the vast majority of students scored 1 mark and many scored full marks. The common error was to give the frequency of the third class interval as 15 and the fourth class interval as 11 instead of 16 and 10

In part (b) some students drew their frequency polygons at the upper class boundaries rather than at the mid-interval values. Students should be advised that they are not expected to continue their frequency polygons beyond the lowest and highest mid interval values.

Question 6

Part (a) was done quite well with most students able to write down a suitable question and define appropriate response boxes to collect the information. Common incorrect answers here include overlapping intervals and non-exhaustive ranges. Students should be discouraged from using ambiguous notation, such as '60+', in favour of words, e.g. 'more than 60'. Indeed, questions designed for questionnaires should be fit for purpose and not require the detailed knowledge of mathematical notation.

Part (b) was done quite well. Many students were able to write down a correct advantage of taking a sample, but a significant number of these were unable to do this explicitly. For example, the answer 'you don't have to do them all' was not accepted as, whilst the statement is true, it does not explain why this would be an advantage (e.g. saves time).

In part (c), many students were able to write down why the sample would not be a good sample, usually by explaining that travelling by bus is only one of the ways people can go to work.

Question 7

Part (a) was done very well. Most students were able to complete the sample space diagram without error. Students should be reminded to continue completing the table using the same notation as that given in the question, ie to include the brackets.

In part (b) most students were able to score at least 1 mark for finding a correct probability, usually $\frac{1}{16}$. Students should be reminded to give their probabilities in an acceptable form, i.e. as a fraction, as a decimal or as a percentage. The use of ratio notation is not accepted.

Question 8

Many students were able to score 2 marks in part (a) and the usual error was to omit the key. Although many students could find the median from the stem and leaf diagram in part (b), few could find the interquartile range in part (c).

Question 9

This question was done well. In part (a) most students were able to describe the relationship between the price of a motorcycle and its age. It should be noted that 'negative correlation' was accepted in this examination but not 'negative' on its own.

In part (b) many students were able to draw a suitable line of best fit.

In part (c) most students were able use their line of best fit to find a sensible estimate for the age of the motorcycle for the given price, but students should be advised to show their working by drawing appropriate lines to support their estimate.

Question 10

The majority of students were able to score 2 marks and most students scored at least 1 mark. Students must be more specific as to their reasoning and many students lost marks as they gave two reasons which referred to the same mistake.

Question 11

This question was not answered well. Very few students were able to score all 3 marks. Many students scored 1 mark for drawing a table with columns/rows for men and women and columns/rows for read and not read. Students should be advised that when drawing two-way tables, columns/rows for totals are required.

Question 12

This question was answered well and the majority of students scored at least 2 marks for identifying either the median weight or the number of kangaroos that weighed between 70 kg and 90 kg. Students should be advised that when using cumulative frequency diagrams lines should be drawn on the diagram to support their working.

Question 13

Parts (a) and (b) were answered well and it was encouraging to see that students knew how to calculate moving averages.

In part (c) the correct answer of 'upwards' was used by only a few students. 'Rising' or 'increasing' were the common answer given and whilst the marks were awarded, centres should note that the correct answer should be that there is an upward trend.

Question 14

Part (a) was answered correctly by the vast majority of students.

Part (b) was done well. Many students were able to write down the class interval which contains the median. A common incorrect answer here was 30 < w ≤ 35, presumably because this is in the middle of the five class interval given in the table.

Part (c) was not done as well. Some students used end points rather than midpoints when finding the estimate for the mean. Other common incorrect answers here include dividing Σfx by 5 (rather than 40), and dividing the sum of the mid interval values by 5.

Question 15

This question was either answered well, with a variety of methods seen, or done poorly. The common incorrect answer seen was 10, found by dividing the sample size by 3.

Question 16

Many students scored at least 2 marks in part (a). Errors included plotting the lower quartile incorrectly or misreading the scale.

In part (b) many students identified that the point represented by the X was an outlier. Some students left this part blank.

Part (c) was answered better than in previous series. Many students were able to score 2 marks by comparing the medians and IQR/range. Some students lost marks because they either stated numbers with no comparison being made or gave the same reason twice e.g. compared IQR and compared range. Students found it difficult to give a third comparison usually failing to compare skew.

Question 17

Many students were able to draw a tree diagram and gained full marks for part (a). A common error here was to draw just one pair of branches, either for tank A or tank B, or to draw a pair of branches for both tank A and tank B but not link them together.

Most students were able to answer part (b). The common error was to add rather than multiple the probabilities.

Only the most able answered part (c) well. A common error was to add the probabilities instead of multiplying. It was disappointing to see that these students did not recognise that this was an incorrect method as it gave them a probability greater than 1.

Question 18

This question was answered better than in previous series. Some students were able to calculate a weighted mean. Common errors included giving answers of 98, 98.3 or 98.30

Question 19

Part (a) was answered well by many students. Students were able to recognise that this question was worded differently from previous series and were able to work out that 15 tigers were weighed.

Part (b) was answered better than the previous series but it is still clear that students do not know the formula for calculating the standard deviation. Those students that knew the correct formula answered the question well.

Summary

Based on their performance on this paper, students are offered the following advice:

- Read each question fully and carefully before attempting to answer it
- Show working to support the final answer
- Be encouraged to use a ruler when drawing straight lines
- Check the scale given in graphical questions
- Show their working by drawing lines to and from their curve or straight line segments when interpreting cumulative frequency diagrams
- Not be expected to continue their frequency polygon diagrams beyond the lowest and highest mid interval values
- Check that probabilities do not have values greater than 1
- Know how to calculate a standard deviation

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