Principal Examiner Feedback

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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 questions 1, 3, 4 and 10(c).

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

The majority of students were able to score full marks, however a few students failed to shade their partitions. A common error was to draw a comparative bar chart.

Question 2

Part (a) was answered well and the majority of students found the median number of people per household.

In part (b) a majority of the students were able to calculate the mean correctly, however some students divided their $\sum fx$ by 6 instead of 80.

Question 3

Many students obtained at least one mark in part (a). The vast majority of students were able to identify the number of experiments as discrete data and miles as continuous data. A common error was to write categorical for one of the answers.

In part (b) the outlier was clearly circled by the majority of the students.

In part (c) the vast majority of students were able to state the type of correlation correctly as negative.

In part (d) many students were able to draw an acceptable line of best fit.

Many students were able to give a correct response in part (e) including those that followed through from an incorrect line of best fit in part (d). Some students lost the mark as they misinterpreted the scale on the *y*-axis.

Question 4

In part (a) 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.

Part (b) was poorly attempted and it appeared that the vast majority of the students failed to understand how to compare two frequency polygons. Students must compare the lengths of calsl rather than the number of calls.

Question 5

Many students were able to score both marks in part (a). A common error was for students to use incorrect notation for the probability.

Many students were able to score both marks in part (b). A common error was for students to use incorrect notation for the probability.

Many students were also able to score both marks in part (c). A common error was for students to calculate an estimate of 62.5 and then not rounding up or down.

In part (d) many students were able to give a correct comparison with the actual frequency of 16. Some students compared probabilities and a few had incorrect figures in their comparison.

Question 6

This question was done quite well with most students able to score at least two marks, usually for 'no scale' and '3D'. A common third answer of 'no y-axis' was stated which could not gain any marks as the student had already stated the equivalent answer.

Question 7

Part (a) was done well. Most students were able to complete the cumulative frequency table correctly.

In part (b) some students drew their cumulative frequency diagrams to the mid-interval values rather than the upper class boundaries. Some students ignored the scale on the horizontal axis and plotted the cumulative frequencies at 1 cm intervals. Students should be reminded that they must join all the plotted points either by a curve or by straight lines.

Part (c) was not done well. A minority of the students answered this question correctly. Many students did not know how to find the quartiles.

Question 8

Parts (a) and (b) were done very well and the students obtained full marks.

Part (c) was not done well. Some students were able to find an estimate of the mean from a grouped frequency table. Many students did not realise that they had to find the mid points of the class intervals in order to calculate the mean. Common incorrect answers here include dividing $\sum fx$ by 4 (rather than 30), dividing the sum of the mid interval values by 4 and to use end point rather than midpoint.

Question 9

Part (a) was done poorly and many students could not give a correct reason.

Part (b) was poorly attempted. Many students wrote down a question but missed out the time frame such as per month etc. Common incorrect answers here include overlapping intervals, no units and non-exhaustive ranges. Students should be discouraged from using ambiguous notation, such as '30+', in favour of words, e.g. 'more than 30'. Generally, questions designed for questionnaires should be fit for purpose and not require the detailed knowledge of mathematical notation.

In part (c) many students were unable to answer this correctly. Some students identified that the sample was biased or only asked one group of people. A few students tried to argue that this was a good sample.

Question 10

The majority of the students could not identify the skew of the distribution of the lengths of the slugs in part (a).

Part (b) was done well. Most students were able to write down the median for the given box plot for Ravi correctly. However, it was disappointing to see many students could not state the lower and upper quartiles correctly. Common incorrect answers for the lower and upper quartile were 27 and 60 respectively.

Part (c) was poorly done. Most students gained one mark as a result of the follow through from part (b). Many students were not prepared for this question and had no knowledge of drawing a box plot.

Part (d) was not done well. Many students were not able to compare the medians, range or IQR and skews of the distributions correctly. Students should be reminded that they cannot simply state the values of the quartiles but must make a comparison.

Question 11

In part (a) the majority of the students were able to calculate the required index number. Common errors in calculating the index number include $\frac{1263}{1196}$, i.e. omitting to multiply by 100, and $\frac{1196}{1263} \times 100$.

In part (b) the majority of the students were unable to give a complete interpretation of the value, usually stating that the index number represented an increase but not mentioning the percentage amount.

Question 12

Part (a) was poorly attempted and the majority of the students did not gain any marks. It was disappointing to see that students did not know how to calculate a moving average.

In part (b) 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 13

This question was done well and the majority of the students obtained full marks in parts (a) and (b). A common mistake made in part (b) was to find the probability as "out of 12". Students should be reminded to use correct notation for probability.

Question 14

Part (a) was not done well. A number of students were unable to label the second pair of branches correctly. Many students did not realise that the probabilities must add up to one for each pair of branches.

In parts (b) and (c) many students were able to find the required probabilities and give their answers in a suitable form usually as a decimal. By far the most common error here was to add the probabilities rather than multiply them. Students should be reminded to check that their probabilities do not have values greater than 1

Question 15

This question was done quite well and the majority of the students obtained full marks. A common mistake made was to round up to 13. Some students left their answers as 12.15 which only gained one mark.

Question 16

This question was not done well. Most students did not appreciate that they were being asked to calculate a weighted, or combined, mean for the ages of the boys and the girls. By far the most common error here was to simply find the numerical average of the given ages (16.95).

Question 17

This question was poorly done. A minority of students were able to quote the required formula and calculate the standard deviation correctly. However, some were able to score a mark for calculating the mean. The majority of the students were ill prepared and had no knowledge of how to calculate a standard deviation.

Summary

Based on their performance on this paper, students should:

- 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 questions.

- Show their working by drawing a "vertical" line from the" horizontal" axis to their curve or straight line segment 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