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Principal Examiner Feedback

January 2014

Pearson Edexcel Level 1 Award In Statistical Methods (AST10)

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Introduction

It was pleasing to see so many students attempting all the questions.

Generally the standard of the written communication was high with diagrams and charts clearly annotated.

Some students did not write their answers on the answer lines provided.

The presentation and use of probabilities was an issue for some students.

A significant number of students simply wrote their answers on the answer line without showing any of the intermediate stages in their calculations.

Reports on Individual Questions

Question 1

This question was done very well. In parts (a) and (b) virtually all the students were able to extract the required information from the bar chart.

In part (c) virtually all the students were able to complete the bar chart for Sunday.

Question 2

This question was generally done well, though some students did not apply the key and simply counted small squares.

In part (a) most students were able to complete the pictogram correctly for Patrick. A common incorrect answer here was to draw 6 pictures instead of 2 pictures, ie 24 small squares.

In part (b) most students were able to write down the number of stamps for Esther.

In part (c) most students were able to work out the difference in the number of stamps sold by Jose and Susan. A common incorrect answer here was 2, ie 2 small squares.

Question 3

In part (a) most students were able to write down the correct word to describe the likelihood of the given event. Common incorrect answers here were “likely” and “unlikely”.

In part (b) most students were able to mark the probability scale to show an event that is likely to happen. A common incorrect answer here was to mark the probability scale at 1

In part (c) most students were able to mark the probability scale correctly to show the required probability but a significant number of students incorrectly marked the probability scale at 0.5

In part (d) most students were able to write down the probability for the required outcome. Common unacceptable answers here were “1 out of 2” and 1:2
Students should be reminded to write probabilities as fractions, decimals or percentages.

Question 4

This question was done very well. Virtually all the students were able to extract the required information from the given results to answer each part of the question correctly. Students should be reminded to write their final answers on the answer lines provided.

Question 5

This question was generally done well. In part (a) virtually all students were able to write down the engine size for the Mazda.

In part (b) virtually all the students were able to write down the make of the car with the smallest engine size.

In part (c) virtually all the students were able to write down the names of the two 5 years old cars with 2 owners.

Part (d) was done less well. A significant number of students wrote down the median of the engine sizes as 2.4, i.e. the median of the unordered data. A small number of students calculated the mean of the engine sizes.

Question 6

This question was done quite well, though some students did not use the key correctly, confusing the information for girls with the information for the boys.

In part (a) most students were able to work out the difference in the numbers of boys and girls absent on Friday. Common incorrect answers here were 4, 6 and 7

In part (b) most students were able to work out the total number of girls absent for the week. A common incorrect answer here was 19, i.e. the total number of absences for the boys. A significant number of students did not show how they calculated their totals - potentially losing both the method mark and the accuracy mark for their incorrect totals. Students should be advised to show all the stages in their calculations.

In part (c), most students were able to write down two correct comparisons in the recorded absences. Some students incorrectly interpreted student absences as students being late and consequently gave incorrect statements for their comparisons, eg “There were more boys late than girls”. Students should be advised that simply writing down the values they have found,
eg “Total boys = 19 and Total girls = 14”, does not count as a comparison.

Question 7

This question was done well. Most students were able to write down all the possible combinations for the cards. A significant number of students gave their combinations in different orders, eg CD as well as DC.

Question 8

This question was done well. Most students were able to find the probability that it will not rain. Here, as elsewhere, many students did not show how they obtained their final answer. A common incorrect answer, often appearing on its own without working, was 45

Question 9

Part (a) was not done well. Many students were unable to design a suitable and efficient data collection sheet to record the results. A common unacceptable answer was a table with columns headed with e.g. “Roll number” and “Number on dice”.

Part (b) was not done well. Few students were able to explain clearly why the dice may not be biased. Common incorrect answers often explained that the outcome of rolling a dice depends on the way it is rolled. Some students stated incorrectly that only coins and/or spinners can be biased.

Question 10

Parts (a) and (b) were generally done well.

In part (a) most students were able work out the range of the given numbers. Very common incorrect answers here were 15 (median) and 14.9 (mean).

In part (b) a very common incorrect answer was the median (15).

Part (c) was not done well. Few students realised that they need to compare the total numbers of points scored by the teams in each year - most simply compared the difference in the mean scores (3.6) and concluded that e.g.
“3.6 more points scored in 2013”. Some students stated that more points were scored in 2013 but did not back this up with a relevant calculation.

Question 11

Part (a) was done quite well. Many students were able to write down the required probability. Very common incorrect answers here were $\frac{4}{5}$ and unlikely/even/likely. Students should be advised that a demand for a <u>probability</u> requires a numeric response, whilst a demand for a <u>likelihood</u> requires a word response.

In part (b) less than half the students were able to write down the required probability. A significant number of students gave their final answer as $\frac{9}{9}$, which was accepted on this paper.

Question 12

This question was done quite well. Most students were able to identify at least one thing wrong with the graph. Common incorrect answers here were e.g.
“the graph is the wrong way round - the names should be on the bottom”,
“there is a number missing from the scale” and “the bars are too thin”.

Question 13

Part (a) was generally done well. Most students were able to complete the frequency table for the given data. A common error was to miss out one or two of the numbers. Students should be advised to check their work more carefully, e.g. by comparing the total of their frequencies with the total number of data.

Part (b) was done quite well. Many students were able to write down the mode from the frequency table. A common incorrect answer here was 11, i.e. the frequency of the mode.

Part (c) was not done well. Few students were able to work out the total number of patients in the sample. A very common incorrect answer here was 30,
ie 5 + 11 + 8 + 6. Relatively few students gave their final answer incorrectly as 10,
i.e. 1 + 2 + 3 + 4

Question 14

This question was not done well. Few students could write down an estimate for the required probability. Very common incorrect answers here were $\frac{1}{2}$, "evens" and $\frac{33}{50}$

Students should be advised that an estimate in this context is a precise value and does not involve rounding.

Question 15

Parts (a) and (b) were done well. Most students were able to extract the required information from and complete the two-way table.

Part (c) was not done well. In part (c)(i) less than half the students were able to write down the probability of picking a person who had an orange drink, a common incorrect answer here was $\frac{1}{39}$, and in part (c)(ii) few students could write down the probability of picking a male who had a milk drink, common incorrect answers here were $\frac{19}{51}$ and $\frac{19}{49}$

Question 16

This question was done well. Most students were able to give at least one correct thing wrong with the question. Many students identified the lack of a suitable time frame and the omission of a nil response. Common incorrect answers here were e.g. "doesn't say whether to circle or tick the options", "doesn't ask if they are male or female" and "there is no 2 – 3 option".

Question 17

This question was answered quite well. In part (a) many students recognised the downward trend in the number of houses sold, but few could describe this accurately. A common inaccurate response was "decreasing". By far the most common incorrect response was "negative correlation".

In part (b) many students were able to read the time-series graph accurately to find the total number of houses sold in 2011. A significant number of students did not show the values from the graph for each quarter - potentially losing both the method mark and the accuracy mark for writing down an incorrect answer without working. A common incorrect answer here was 46, ie omitting to include the amount for the first quarter (23) in the total.

In part (c) most students were able to use the information given in the graph to write down a suitable estimate for the required quarter.

Question 18

In part (a) only about half the students were able to interpret the stem and leaf diagram to find the number of people that took more than 40 seconds to find the word. A common incorrect answer here was 3, ie omitting to include the times in the next row of the table (50 and 52).

In part (b) about half the students were able to write down the modal time. A common incorrect answer here was 6, ie omitting to include the stem (2) with their answer.

In part (c) about half the students were able to find the range of the given times. Some students, having found the greatest (52) and the least (18) times for the results continued incorrectly to add them.

Question 19

Only the best students were able to use the given information to work out the required probabilities. A common incorrect answer was (a) $\frac{1}{4}$, (b) $\frac{3}{4}$, and (c) $\frac{1}{4}$

In part (a) only about half the students knew that they had to add the probabilities for A and B.

In part (b) some students were perhaps a little fortunate for writing an answer of ¾ when perhaps they had used an erroneous method. A common incorrect answer here was 0.25

In part (c) a surprising number of students wrote 0.3 for C in the table but then went on to give some other answer on the answer line. Common incorrect answers here were 0.7 and $\frac{0.3}{100}$

Students should be reminded about the way they present probabilities in their answers, eg $\frac{0.45}{1.00}$ is an incorrect form for the probability 0.45.

Question 20

In part (a) most students were able to score both marks for correctly completing the table. When students lost marks this was generally due to a single error in reading one of the values.

Part (b) was not done well. Few students were able to plot all the points accurately and a surprising number of students did not attempt to plot any of the points. A common error here was to plot the French marks on the Spanish marks axis and visa versa.

Part (c) was done quite well, but a significant number of students were unable to describe the correlation shown in the marks. Common incorrect answers here were eg “Spanish marks higher than French marks”, “they are roughly the same”, “they are increasing” and (perhaps surprisingly) “negative correlation”.

Question 21

A significant number of students were able to score at least 2 marks in this question - usually for correctly calculating at least two of the required angles or calculating one of the required angles (usually 70^o for Comedy) and drawing it accurately in the pie chart. A surprising number of those students who were able to calculate all the angles correctly were then unable to draw them accurately in their pie chart.

Summary

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

- to write their final answers on the answer lines provided,
- to show all the stages in their calculations,
- to write probabilities as fractions, decimals or percentages,
- that a demand for a probability requires a numeric response, whilst a demand for a likelihood requires a word response,
- to check their work more carefully, e.g. by comparing the total of their frequencies with the total number of data.

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