AQA

AS LEVEL
FURTHER MATHEMATICS

7366/2S Paper 2 Statistics
Report on the Examination

7366/2S
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General

The paper appeared to offer ample opportunities for students to score reasonable marks. On the other hand, the highest marks on some questions were rarely achieved. Students should consider the full specification when preparing for the exam, rather than focusing purely on questions that have appeared in previous series.

Question 1

The vast majority of students scored the mark. The most common error was to not square the standard deviation of Y before adding it to the variance of X.

Question 2

The vast majority of students scored the mark but not as many as did in question 1. The most common error was to choose the probability associated with taking an individual value of T, though a significant proportion chose answers associated with incorrect formulae for the variance of T.

Question 3

The vast majority of students scored full marks. Some students lost marks for not showing enough working, particularly for the final step. A minority of students used incorrect formulae and were unable to progress very far with a solution. Most students found E(X) and then used it to find E($5X - 7$) but a small proportion found values of $5X$ or $5X - 7$ first and then found E($5X - 7$).

Question 4

The majority of students scored at least one mark but a significant proportion scored no marks. For those students attempting the correct method, many did not write down all the probabilities required to show that the correct region had been identified. Some rounded their intermediate results too much and so their values did not lead to the given answer. A minority of students found the correct probabilities but assigned them to the wrong regions. Some students did not understand what the question required and attempted a binomial hypothesis test. A significant proportion attempted the Poisson approximation to the binomial distribution which is neither relevant nor on the specification.

Question 5

(a) The vast majority of students did not calculate the value of s^2 correctly, due to not using the correct formula. Many students used the population variance formula and so obtained a biased estimate. Some students recognised that this would be the case and attempted to adjust the formula by replacing n with $n - 1$. As a result, few students scored full marks. The majority of students scored three marks by attempting the rest of the solution correctly. A minority used an incorrect formula for the confidence interval and some used an incorrect z-value, usually corresponding to the 97% point of the distribution rather than 98.5%.

(b) The majority of students scored the mark for this part. Some students gave an incorrect conclusion or no conclusion despite correctly identifying that the value lay within the confidence interval. Some students made significant errors in part **(a)** so that the value did not fall within their confidence interval and were unable to score the mark. A minority of students claimed that the statement was wrong because the value was not in the centre of the confidence interval. There was a significant proportion of non-responses.

Question 6

(a) The vast majority of students scored the mark for this part with the most common error being finding the probability of more than 60 motor claims rather than the required probability.

(b) The majority of students scored full marks for this part. One of the most common errors included using an incorrect value of λ, usually 65, and then attempting to find the probability of the number of claims being 48. It was also common to prematurely round the value of λ, leading to an incorrect final answer.

(c)(i) Fewer students scored full marks for this part but it was still a majority of them. A significant proportion only found the standard deviation of one or both distributions and then added them. There was also a significant proportion of non-responses.

(c)(ii) This was the least successfully attempted part of the question but a majority of students still scored full marks. Some students continued from an incorrect value of λ from the previous part though some recovered from that error. A significant proportion of students calculated an incorrect probability, usually including 90 in their region. A minority of students attempted to find probabilities from the two distributions independently and somehow combine them. There was a significant proportion of non-responses.

Question 7

(a) The majority of students scored at least seven marks for this part with a significant proportion losing the final mark for errors in the hypotheses or the conclusion. Some students wrote the hypotheses the wrong way round or did not refer to the variables. A significant proportion of students omitted a conclusion or wrote a definite conclusion, using words such as “show” or “prove” rather than “suggest” or “support”. Some conclusions did not include reference to the context. Students who were less successful made calculation errors or wrongly accepted the null hypothesis. Very few students scored no marks, usually because they did not recognise the type of question they were being asked.

(b) A majority scored at least one mark for this part, usually for an interpretation in context. Many students did not follow the instruction to consider observed and expected frequencies and so did not achieve the first mark. A significant proportion of students repeated their conclusion to the hypothesis test. There was also significant non-response.

Question 8

The majority of students scored at least six marks with marks most commonly lost for errors integrating or not showing a more accurate answer before the final rounded answer. Students who were less successful either were unable to find the equation of the straight line or used an incorrect variance formula. A significant proportion of students attempted to find variances of each component independently and add them together.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the Results Statistics page of the AQA Website.