AQA

AS LEVEL
FURTHER MATHEMATICS

7366/2S Paper 2 Statistics
Report on the Examination

7366
June 2022

Version: 1.0

General

The paper offered ample opportunities for all students to score a reasonable number of marks. There was an improvement in the quality of written responses and this was reflected by a stronger overall performance on the challenging questions on the paper. There was an improvement in the quality of the conclusions written for hypothesis tests with well-prepared students clearly using the language modelled in previous mark schemes.

Question 1

Nearly all the students scored the mark for this question which presented a straightforward start to the paper.

Question 2

Students found this question more challenging than question 1 but the majority of students did score the mark. There was an even split between students incorrectly choosing 32 because of not squaring the mean in the calculation or students choosing 784 which corresponded to the variance rather than the standard deviation.

Question 3

In part (a), the vast majority of students scored full marks. The most common incorrect answers given included 0.25 or 0.5. Some students were not clear in stating which of 1 or 0.25 was their answer for the median.

In part (b), the majority of students scored full marks. Some students only found the variance and did not continue to find the standard deviation. A minority of students used an incorrect formula for the variance, for example not squaring the mean. Some students made calculation errors.

In part (c), the majority of students scored full marks, either obtaining the correct answer or a correctly followed through answer. Common errors included multiplying by the standard deviation instead of the variance, finding 9 Var (A) – 2 instead or making calculation slips.

Question 4

In part (a), the majority of students scored at least two marks. A significant proportion of students used an incorrect formula, including using the full width of the confidence interval when the formula used required the half-width. Some students did not square root the variance when using it in the formula. Some students identified the wrong z value, often choosing the value for a 98% confidence interval.

In part (b), the majority of students scored the mark. Some students used the word "it" rather than identifying the value, which was condoned on this occasion. A minority of students calculated their own confidence interval incorrectly despite the correct interval being given in the question. A common incorrect answer was assuming that Joey's value needed to be in the exact centre of the confidence interval for the confidence interval to support the claim.

Question 5

In part (a), the majority of students scored full marks. There was a welcome increase in the use of calculators to find the values of the integrals. Common errors included treating the variable as discrete rather than continuous, finding the mean of the variable instead of the required probability, and calculation or rounding slips.

In part (b), the majority of students scored the mark. A common incorrect value given was 0.25.

In part (c), the majority of students scored full marks but many students scored no marks. There was again a welcome increase in the use of calculators to find the values of the integrals. Some students attempted $(\mathrm{E}(X))^{-2}$ instead of $\mathrm{E}(X^{-2})$. A minority of students did not show sufficient working for a "show that" question. There was a significant proportion of students who did not attempt the question.

In part (d), the majority of students scored full marks but around a sixth of students scored no marks or made no attempt at it. Common errors were calculating an incorrect value of $\mathrm{E}(Y)$ or using an incorrectly calculated value in place of the given value from part (c).

Question 6

In part (a), the vast majority of students scored the mark. The most common errors included finding standard deviation instead of variance, assuming that the mean was equal to the standard deviation instead of the variance or giving the answer of 0, arguing that the Poisson distribution did not have a variance!

In part (b), the majority of students scored at least five marks. Many students lost the final mark for either giving a definite conclusion or not referring to the mean number of computers. Some students gave the hypotheses the wrong way round. A common error was to find the wrong Poisson probability for the test with many finding $\mathrm{P}(Y > 53)$ or $\mathrm{P}(Y = 53)$ instead.

In part (c), a slight majority of students did not score the mark. A significant proportion of students gave a description of a Type I error instead. Other students did not give an answer in context.

Question 7

In part (a), the majority of students scored at least two marks. Many students omitted part of the solution: either one of the explanations for the possible degrees of freedom or not identifying that pooling was needed due to there being an expected value less than 5. Some students got their explanations for the two different degrees of freedom the wrong way round. A minority of the students, who did not identify the expected value less than 5, pooled the wrong rows or columns. Some of the explanations for the degrees of freedom were incomplete so it was not clear which of the possible values was being explained.

In part (b), the majority of students scored at least three marks. Many students wrote definite or incorrect conclusions. A significant proportion of students wrote their hypotheses the wrong way round. Some students identified an incorrect critical value, usually because they used the wrong value for the degrees of freedom.

Mark Ranges and Award of Grades

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