

FURTHER MATHEMATICS
General Certificate of Education
Summer 2023
Advanced Subsidiary/Advanced
FURTHER STATISTICS A – AS UNIT 2

Overview of the Unit

Once again, this unit proved accessible to most candidates. In general, candidates performed as expected, with the exception of question 6, which proved to be very challenging for the majority of candidates. Only a small proportion of candidates were able to form the correct probability distribution required in question 6(c). Question 3 on the exponential distribution also proved challenging. However, the non-contextualised questions on random variables, and the question assessing Spearman's rank correlation coefficient were relatively well-answered.

Comments on individual questions/sections

- Q.1 In general, this question was very well answered, as one might expect. It was the most successfully answered question on the paper and proved a positive start to the paper for many candidates. Some common errors included subtracting $5^2\text{Var}(X)$, instead of adding this term; this led to an answer of -1344 , which should have led candidates to question the validity of their answer.
- Q.2 This was a twist on the classic 'find the equation of the regression line' question, which many candidates were not prepared for. Candidates seemed unable to apply the requisite pure mathematics skills from GCE Mathematics Unit 1. Many candidates tried to calculate S_{xy} and S_{xx} , which were not required.
- Q.3 Once again this year, this question on the exponential distribution was poorly answered. It was the most poorly answered question on the paper. Candidates seemed to have trouble recognising the exponential distribution as well as using it. Many candidates incorrectly identified $\lambda = 2$, but did earn some credit for following through correctly in parts (a) and (b). The link between the Poisson distribution and the exponential distribution was poorly understood.
- Q.4 This question was one of the better answered questions on the paper. Candidates were generally able to use the cumulative distribution function as required. Some common errors included substituting 0.75 into $F(x)$ in part (d), and integrating the cumulative distribution function.
- Q.5 This was also a well answered question. The majority of candidates were able to score well in carrying out the hypothesis test in part (b)(i) and calculating Spearman's rank correlation coefficient in part (b)(ii). Interpreting the results in context proved a more challenging task.

Q.6 This was the second most poorly answered question on the paper. Parts (a) and (b) were relatively well answered. The straightforward nature of the hypothesis test meant that many candidates were able to earn marks for calculating the expected frequencies and the χ^2 test statistic. An obvious, common error was not combining classes for expected frequencies less than 5.

Part (c) proved challenging even for the most able candidates. Only a minority of candidates were able to successfully complete the various steps involved in calculating the expected daily net income. Some candidates recognised the distribution $B(22,0.9)$, but did not take into account the differing probabilities for the different number of groups that turned up.