NZQA
NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

Scholarship

2011 Assessment Report

Statistics and Modelling

COMMENTARY

Overall, the standard of candidate answers was satisfactory with the best-answered questions being the written interpretive style Questions One, Two, and Three and the hardest questions being the more mathematical questions involving probability and linear programming in Questions Four and Five. Many candidates started questions but their ability to complete them was the deciding factor for them in achieving a Scholarship standard.

SCHOLARSHIP WITH OUTSTANDING PERFORMANCE

Candidates who were awarded Scholarship with Outstanding Performance typically:

- made clear, specific, and succinct statements with evidence such as the number of people employed at a particular time
- integrated knowledge from different aspects of the course and applied this knowledge to unfamiliar situations
- presented well-reasoned and sensible answers, often refining solutions after realising their first answers were not realistic
- wrote several distinct statements about graphs and predictions
- understood the depth required in the more difficult parts of the questions
- used the lower end of the confidence interval, for a prior estimate of p, to calculate how many more people should be surveyed
- considered and integrated statistical and contextual features when discussing validity of predictions or forecasts
- described statistical processes such as random sampling methods using correct vocabulary and including all the necessary steps
- wrote coherently and found different aspects to comment on, for each of the graphs
- gave two accurate and distinct reasons why the time series forecasts in Q1(b) may be invalid
- gave an accurate comment on the validity for each of their predictions in Question Three (b)
- demonstrated that they were able to solve complex problems, for instance Question Four (c) and Question Five (a)(ii)
- showed a high level of mathematical and statistical thinking in relation to probability distributions, evidenced by their answers to Question 4.

SCHOLARSHIP

Candidates who were awarded Scholarship but not Scholarship with Outstanding Performance typically:

- recognised basic material and applied it correctly, for instance the predictions in Question One (b)
- described the trends from the graphs in Question One (a) and / or Question One (c) accurately enough to make at least four "correct" observations for Question One (a) and / or three "correct observations" for Question One (c)
- gained a lot of their marks in Question One and Question Three by using time series models and regression models to make predictions and comment on their validity
- calculated accurately and gave answers in context, for instance for the confidence interval in Question Two (a)
- detected and calculated the conditional probability in Question Four (a)
- correctly applied linear programming techniques to solve Question Five (a)(i) and thus described the delivery plan correctly
- demonstrated that they were able to fully describe a stratified sampling method
- displayed the ability to use probability models but did not completely integrate other topics as did candidates who achieved Scholarship with Outstanding Performance.

OTHER CANDIDATES

Candidates who were not awarded Scholarship or Scholarship with Outstanding Performance typically:

- misinterpreted the seasonal effects in Question One
- made vague statements without evidence or much context
- speculated as to the cause of something seen in the graph
- displayed a vague knowledge of a few aspects of the curriculum
- wrote a lot of words that repeated their observations from the various graphs
- gave generic answers without relating their answers to the context
- described each individual movement on the graphs rather than making relevant comments backed up with evidence
- did not give a full description of a random sampling method
- did not construct a confidence interval
- applied methods inappropriately and / or incompletely
- made incorrect assumptions or gave insufficient solutions e.g. in Question Three (c) where all three components – direction, justification, and direction – were required
- contradicted themselves in their comments about the graphs. They generalised too much in their observations and did not supply sufficient details about the validity of forecasts.
- made correct predictions in Question Three (b) but made incorrect comments about their validity.