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Free-Standing Mathematics Qualification

Using and Applying Statistics 6990

Advanced Level

Report on the Examination

2010 examination – June series

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Using and Applying Statistics (6990) Examination

General

The paper was accessible to its target group. There was no evidence of candidates running out of time. The majority of candidates scored marks on all of the questions on the paper. In general many candidates performed well, scoring above the mid 30s. It was evident, and pleasing, that many candidates were well prepared for this examination and some excellent scripts were seen. A minority of candidates appeared not to have a scientific or graphical calculator and, even worse, some appeared not to have any calculator at all in this examination. It is imperative that the candidates are proficient at using a scientific or graphical calculator. Candidates are expected to use a calculator in answering all of the questions in this examination. Some candidates lost accuracy marks for not working to an answer correct to 3 significant figures or the required degree of accuracy as specified in the particular question.

Topics that were well done:

- Calculating percentage change.
- Obtaining cumulative frequencies. Finding the median and interquartile range from their cumulative frequency curve.
- Money calculations.
- Calculating frequencies from a given histogram.
- Using a calculator to obtain means and a correlation coefficient.
- Standardising and obtaining probabilities from a normal distribution.

Topics which candidates found difficult:

- Reverse percentage calculation.
- Obtaining the equation of a regression line from a calculator.
- Interpretation.

Question 1

In part (a) nearly all candidates scored the mark for identifying Germany. In parts (b) and (c) some candidates failed to give their answers to 3 significant figures as required by the rubrics of the examination. Part (d) was found to be beyond many candidates. They simply multiplied the population of Hungary by 0.0021 and subtracted this from the population. Reverse percentage calculations need to be better understood by candidates.

Question 2

This question was well attempted by a large majority of the candidates. However, a number of candidates failed to score 3 marks in part (a) because they did not correctly plot the cumulative frequency values at the upper class boundaries. The tolerance we allow is ±1/2 square (i.e. ± 1 mm).

Part (b) was very well done. In part (c), many candidates correctly calculated an answer but failed to maintain their method working to 4 significant figures throughout; they often rounded a value and hence lost the accuracy mark.

Question 3

This was a very well attempted question and many candidates scored at least 7 marks.
In part (c), many candidates failed to use the correct mid-points of the class intervals or did not correctly recognise the total frequencies of each class interval. Interestingly, part (d) was done much better than part (c). In part (e), candidates who correctly identified the maximum possible weight of 513kg for the parcels in part (d) would usually say that the van was overloaded by adding Clive's weight of 90kg to the maximum parcel weight. They did not realise that the question asked about the *likelihood* of the van being overloaded.

Question 4

Many candidates scored 4 marks in this question.
Part (a) was well done. Part (b) was quite poorly done. Only the very able candidates scored full marks on this part by recognising that the standard deviations were almost the same and hence there was no statistical justification for Steph's belief.

Question 5

The majority of candidates scored highly on this standard question. Some candidates failed to write down two pairs of coordinates as stipulated in part (b)(ii) of the question. Also, many candidates could not explain the gradient of the regression line nor the *y*-intercept in context. A number of candidates were confused by the values given on their calculator display and mixed up the coefficients of the regression line equation, sometimes confusing them with the means!

Question 6

Parts (a) and (b) were well done. A number of candidates had been prepared for a normal distribution question and they obtained the correct answer in part (c). Many candidates could not correctly calculate the required probability or percentage in part (d). They were confused that a phi value of 6.406 was in effect equal to 1.

Portfolio
FSMQ Advanced Level – June 2010

It was pleasing to see a great deal of variety in the portfolios produced for the Advanced level FSMQ. In the spirit of FSMQ many centres encouraged candidates to obtain data or develop projects from other areas of study. It should be noted that a high mark in Strand One cannot be achieved by candidates unless independence in the true sense of the word is demonstrated, not just carrying out a given project without advice.

Most centres submitting **'Working with Algebraic and Graphical Techniques'** portfolios ensured that candidates produced a report on fitting a function to non-linear data by plotting a linear function. This is an essential requirement and candidates not including this work can only achieve a maximum mark of 24. There should also be a demonstration of algebraic manipulation and techniques and if this is not present the maximum mark would be 35.

There were some interesting portfolios produced for **'Using and Applying Statistics'** with examples from biology and geography. For a mark of 40 or over candidates must include high level work on such statistical topics as Mann-Whitney, t-test, Chi-squared or Wilcoxon signed rank test etc.

Portfolios produced for **'Using and Applying Decision Mathematics'** developed a range of projects, from wedding planning to a dinner party. Candidates can often relate their analysis to 'real life' by carrying out the tasks described and finding if there are any hidden pit falls not realised during the design.

The vast majority of candidates demonstrated the need to check their work, especially in the Algebra portfolios; although some candidates did not actually state that they were "checking".

Candidates did summarise their work and in many cases looked at their initial assumptions and how they affected the outcomes.

It was very pleasing to see excellent internal moderation from centres and also the detailed comments on the Candidate Record Forms. Please continue to provide these as they greatly assist in moderation.

Mark Ranges and Award of Grades

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