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General Certificate of Education

Statistics 6380

SS03 Statistics 3

Report on the Examination

2010 examination – January series

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General

Most candidates attempted all the questions and demonstrated knowledge of all the topics. There was some evidence that candidates ran out of time if they did not use a scientific calculator for evaluations such as that for the product moment correlation coefficient. Most, but not all, candidates remembered to quote final answers to 3 significant figures. Some lost marks unnecessarily because written evidence of the method used, particularly for χ^2 and Kruskal-Wallis test statistics and for Spearman's rank correlation coefficient, was not supplied. Marks were often lost by candidates who did not explain their conclusions in the context of the question.

Question 1

All candidates made a good attempt at part (a) and could correctly state the relevant hypotheses and find the +/– values. There was uncertainty about which probabilities from the binomial tables were required and often $n = 10$ and/or $p = 0.1$ were incorrectly used. The binomial probability found was frequently incorrectly compared to 10% rather than the correct 5% for this two-tailed test. In part (b), there were some excellent answers but candidates often failed to explain a Type II error in the context of the question.

Question 2

Some candidates found the Spearman's rank correlation coefficient in error and several laboured through pages of numerical summations to evaluate the product moment correlation coefficient rather than use a calculator. In part (b), hypotheses were usually stated correctly and many candidates gained full marks. However, some candidates used a critical value from the Spearman's rank tables and some overlooked the fact that it was a one-tailed test. In part (c), there were few responses that fully interpreted the findings in context.

Question 3

Candidates seemed comfortable with this topic and many fully correct solutions were seen. Some candidates did not give the expected values used for comparison in the χ^2 test and therefore lost most of the marks in part (b) if their test statistic was incorrect. Expected values should always be given even if the procedure is completed on a calculator. The hypotheses were often stated the wrong way round with H_o 'an association between selection of work and region of residence'. In part (c), few candidates compared expected and observed data to explain identified sources of association.

Question 4

It was encouraging that many candidates did well on this question. Candidates appeared to evaluate Spearman's rank correlation coefficient with confidence. The test in part (a)(ii) was well carried out by almost all candidates. There was less certainty in part (b), where many errors were seen. Candidates forgot to obtain differences or ranked the data as one whole group. It was encouraging to see that many candidates did show the rankings and method used.

Question 5

Some excellent attempts were seen in part (a): the majority of candidates showed the rankings used and many managed to evaluate *H* correctly. The main mistakes occurred when candidates used ν = 15 or 14 instead of ν = 2. In part (b), almost all candidates correctly selected a Mann-Whitney test and confidently carried out the test.

Mark Ranges and Award of Grades

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