LEVEL 3
CERTIFICATE IN MATHEMATICAL STUDIES

1350/1 Paper 1
Report on the Examination

Question 1

This question involved different aspects of sampling. Students were often unable to give the correct sampling method for **part a.** Common incorrect names included random and stratified sampling. In **part b** students often gave better responses for the disadvantage, with the most common being a reference to the unequal numbers of students in each year group. For the advantage, many students think incorrectly that 'quick' or 'cheap' is a standard response that they can apply to any method. **Part c** was generally answered correctly, and the majority of students could work out the number of students required in **part d.**

Question 2

Students found this compound interest and exchange rate question quite straightforward, with over 75% of the cohort gaining full marks in each part. For weaker students, the most common error was using 1.15 rather than 1.015 as the interest rate in **part a.** A small number of students used simple interest, but could still gain some credit for a correct conversion using the exchange rate.

Question 3

The multiple-choice **part a** was answered correctly by about 80% of the cohort, with the most common incorrect option chosen being primary instead of secondary. Students are becoming very proficient at calculating medians and quartiles from a list of data, with only a small number calculating quartiles incorrectly, usually because of poor arithmetic. The scale for the box plots in **part c** proved difficult for some students. The 2-decimal-place values were hard to plot accurately, so a greater tolerance than usual was allowed in the mark scheme. Students should be reminded to label their box plots. A very small number of students only drew one box plot despite having worked out the required values in **part b**.
Comparison of distributions, as in **part d**, continues to challenge the students. Some students do not understand which statistical measure is an average and which is a spread. Students must also ensure that the comparison is in context, so that an answer of 'the median is bigger' is insufficient. For the averages, there was quite a widespread misconception that the bigger median meant that the swimmers were faster. Those who understood that for spreads they should compare IQR or range usually gave correct values and a comparison about the variation or consistent times.

Question 4

Fermi estimation questions always result in a very wide range of responses. This is a fast rough estimate, so basic assumptions about hours of homework per week and weeks in a school year are all that are needed. A significant number of students went into great detail about number of subjects studied and amount of homework for each, or about hours per school day, in a weekend and in some of the holidays. Some also included extra revision before exams. Students do gain credit for these approaches but waste a lot of exam time with these extra calculations.

Question 5

Students could usually work out the amount of student loan payment Anya had to pay each month, and nearly always based this on the correct loan threshold. However, quite a large number of students did not work out the additional payment needed to repay the whole £2705
The least able students ignored the salary and just divided £2705 by 12

Question 6

Students often coped well with working out the area needed per tree and the number of trees per acre in this modelling and estimation question. The vast majority worked out the area per tree and divided this into the acre value. Those who used the rows and columns method sometimes got confused about which value they needed to multiply and which to divide, but there were some very good attempts seen.
The majority realised that they had only to consider the percentage that would be Nordman fir and usually applied a percentage in range.
The major error was in considering the increase in trees needed in ten years' time, with the majority of the cohort only increasing for one year.
Less than 3% of students included all the necessary assumptions in their calculations.

Part b is a common question for this paper and, as in previous series, students often just stated an assumption they could have changed or said that their answer might be different.

Question 7

The histogram was often drawn correctly in **part a**, with a small number of students making errors in either the width or the height of the last bar.
Just over half of the cohort could answer **part b** correctly, with common errors seen in calculating the part of the bar between 14 and 15.
Counting squares methods other than those originally anticipated were used by a small number of students and could lead to a fully correct solution. However, the majority using these types of methods miscounted the number of squares. Methods using the frequency density scale were more successful.

Question 8

This Income Tax and National Insurance question involving higher rates of both, was answered quite well this series, with many fully correct answers seen. Unusually, a very common error was to correctly calculate higher and standard rate for Income Tax, but to then go on to calculate all of the National Insurance at the standard rate, ignoring the higher rate.
Students who tried to calculate the amount of money left after tax was deducted often ran into problems as they then used this value as their starting point for calculating National Insurance. Students should be discouraged from attempting this method unless the question only asks about tax.
The comparison with £1000 for rent was done well, with almost all students gaining some credit for comparing with their calculated net income.

Question 9

About 60% of the students were able to calculate the AER for both companies correctly. For other students, common errors included using an incorrect time scale for the formula or using 8.75 or 0.875 as their value of i

Quite a large number of students did not seem to understand that the AER would be better for Arzoo if it was lower, therefore leading them to the wrong conclusion.

Mark Ranges and Award of Grades

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