

## **Application of Number Level 3 January 2006**

### **General Comments**

The January 2006 paper was of a similar standard to papers used in previous series. There were two part questions that were flawed, one about an offer of free fuel with a car purchase, the other about hourly pay. They were misinterpreted by many candidates who did a good deal of correct working but scored no marks; some rewording and clarification of the questions would have been helpful. There was little evidence to suggest that the extra 15 minutes reading time was used effectively by candidates. It may be useful for centres to give guidance to candidates on using this time to maximum effect, to read and understand questions, to identify key information, select methods and make rough notes.

The pass mark on this paper and the proportion of candidates obtaining a pass mark were similar to previous series, but there were few instances of centres where candidates appeared to be poorly prepared for the test. Where errors arose, it was either through incorrect choice of method, failure to interpret the information given correctly or through errors in calculation. Incorrect rounding was a common reason for incorrect answers; candidates lost marks by failing to give an answer to a sensible level of accuracy. Often premature rounding or truncation of values led to inaccurate final results.

The questions answered most successfully were those involving finding the cost per square metre of two buildings and expressing the answer as a ratio, and using a formula. Questions involving compounded percentages and trigonometry were often handled well by stronger candidates, but others showed weaknesses in these areas. The mean of grouped data was correctly estimated by more candidates than on some previous occasions. The weakest responses were seen on questions involving interpreting graphical and statistical information, converting units, scaling dimensions and algebra.

### **Comments on Particular Aspects of the Question Paper**

The paper opened with a relatively straightforward question about diesel cars. While most candidates gained some marks on this question, very few completely correct answers were seen. Common errors included failure to approximate a fraction through inaccurate rounding. Some candidates gave their answer as a percentage rather than a fraction. The reverse percentage question was poorly answered, with many candidates failing to identify the correct method, while others omitted to round the answer appropriately. In a complex problem about the value of an offer of free fuel, stronger candidates identified a correct method for finding the value for a complete year, whereas others omitted stages of calculation or failed to select a suitable method to convert between miles and kilometres or to scale up the fuel used. Relatively few candidates overall realised that the question required the value of the offer for eleven months rather than the full year.

A question about download times for electronic data, many candidates found difficulty in converting the number of megabytes to kilobits. In many cases, one stage of the calculation was omitted, leading to an incorrect answer. Part questions involving a check by estimation and a percentage were generally well handled, although some candidates used the incorrect divisor for the percentage question.

In a question about use of credit and debit cards, the correct method to find the increase in the average amount spent per card was often identified, although weaker candidates reversed the calculation. A correct calculation was performed by a good proportion of candidates, but some failed to round the answer appropriately. Many candidates were able to write a statement about pie charts showing the proportion of transactions carried out using debit and credit cards, and the proportion of spending on each type of card. Stronger candidates made a link between the charts to compare the spending per transaction, as required. A part question involving a compounded percentage was handled less well than in previous series, although the question was more difficult. Many candidates assumed a fixed instead of a compounded increase, while others did not realise that the increase was four-monthly and not yearly.

The trigonometry question was handled well by stronger candidates, although some gave an unrounded answer. Others had difficulty in selecting the correct function, while some did not successfully rearrange the equation to find the length of the hypotenuse. In a question asking for the floor area of a building whose dimensions on a scale drawing were given, a common error was to find the area of the scale plan, and then apply the scale factor only once. Calculation of the building cost per square metre was generally well done, and many candidates obtained a correct estimate for the ratio between the building costs on two sites, although some reversed the ratio.

Most candidates gained some marks on the histogram question, but few scored full marks. Some candidates omitted the title and units on the axes, although this was seen less often than in the past. The most common errors were failure to calculate the frequency densities correctly, or use of incorrect, non-linear scales. The statistics questions were answered more successfully than on previous papers. Some candidates failed to realise that in the table of grouped data, the groups were not of equal size and when estimating the mean used an incorrect mid-point for the final group. There were still a significant proportion of candidates who did not apply a correct method to finding the mean of grouped data, finding the total of the midpoints or dividing by the number of groups. The algebra questions were not generally well done, in some cases perhaps through lack of time. Few candidates wrote two correct equations about the data given. Some obtained correct values but few showed a correct checking method.

## **Recommendations to Centres**

Centres must ensure that candidates:

- use the reading time to best effect, to read and understand questions, identify key data and plan their approach to solving the problems, making rough notes if necessary
- practise breaking down complex problems into manageable steps
- solve problems involving construction and solution of simple equations
- solve problems involving conversion between units in different systems
- choose suitable levels of accuracy and be guided by the data provided
- avoid premature rounding in multi-stage calculations
- check to see they have answered each question fully after finishing it
- follow the conventions used for graphical presentations, in particular titles, appropriate labelling and units, and use suitable linear scales where necessary.