

January Test Series 2007

Application of Number Level 3

General Comments

The paper was of a similar standard to papers used in previous series. It was reasonably balanced in its coverage of the skills described in part A of the Key Skills standards, although there were more calculations with percentages than usual, and no question on fractions. The opening question was quite straightforward and will have given candidates an opportunity to make a confident start. Some questions were set in contexts which may have been unfamiliar to candidates, such as digital sampling of music, and the construction of a sundial. There was one misprint in question 5d which dealt with mobile phone ownership amongst people aged between 15 and 24 years. One sentence referred to 'people ... aged between 5 and 24 years'. There was little evidence to suggest that this affected candidates' performance, but due account was taken when scripts were reviewed to ensure that no candidates were disadvantaged by it.

As in previous series, there was little evidence to show that candidates had used the 15 minutes' reading time. Centres are recommended to advise candidates on ways of using this time effectively, to read and understand questions, plan the order in which to attempt questions, to identify key information, select methods and make rough notes in their answer booklet.

The pass mark on this paper was similar to previous series but the proportion of candidates obtaining a pass mark was lower than previously. There was some variation in the performance of candidates in different centres. Whereas some made a reasonable attempt at questions, the performance of others suggested insufficient preparation for the types of question that are commonly seen at this level. Errors were often seen in the choice or application of methods, in identifying and using the information given as well as in calculating results. Incorrect decisions on rounding were a common reason for incorrect answers; candidates lost marks by rounding part way through a calculation, writing down and using rounded results of stages of their method, rather than holding results on their calculator.

Presentation of working is important in Application of Number. Candidates should note that they can gain some marks by showing complete correct methods even if their final answer is not correct. Candidates sometimes failed to gain marks by omitting to round their answers to an appropriate level of accuracy, a common error being on prices in pounds and pence, which must be given to 2 decimal places. Units were often given correctly, although some confusion between pounds and pence was evident on certain questions. Candidates should note that the use of 'p' after a price given in pounds (e.g. '£0.16p') is not acceptable.

The questions answered most successfully were those involving calculations using proportion, percentages and checking by estimation. Questions on finding the mean from a grouped frequency table, area and volume, simultaneous equations and trigonometry were often handled well by stronger candidates, but others showed weaknesses in these areas. The weakest responses were seen on questions involving interpreting graphical and statistical information, converting units and scaling dimensions.

Comments on Particular Aspects of the Question Paper

The paper opened with a question on egg production which proved relatively straightforward for many candidates. Where errors occurred, they involved incorrect conversions between hectares and square metres, or grams and kilograms. Some candidates used an incorrect value for the number of days in a year, whereas others were unable to choose a correct method to find the cost of 35kg of feed when given the cost of 25kg.

A question about digital sampling of music proved demanding. Stronger candidates often obtained a correct answer, but others were unable to construct a method to solve a multi-stage problem involving large numbers.

In a question about the area of a sloping roof, many candidates used the formula for the area of a triangle correctly and showed correct use of Pythagoras' theorem. However, many failed to use a relatively simple scale of 1:100 to find the actual dimensions, whereas others omitted to convert from millimetres to metres. The final part of this question involved finding a cost including VAT, and was well handled by most candidates, although a few lost a mark through premature rounding.

A question about the construction of a sundial used an unusual formula that posed problems for many candidates. A fair proportion gained one mark by correctly substituting values into the formula, but few were able to go on to find the correct angle required by using the inverse tangent function on their calculator. A subsequent part of this question asked for the area of brass plate in the triangular pointer of the sundial. Many candidates found the height of the pointer using the tangent of the angle given, but few went on to find the area. A common problem was in the fact that the dimensions of the inner triangle were three-quarters of those of the outer one, and many candidates assumed that the area of one would be three-quarters of the area of the other. A part question about the weight of the base of the sundial used a formula to find its volume. A common problem here was incorrect substitution of the diameter of the base instead of the radius.

Many candidates gained some marks on a question about mobile phones, but few answered every part successfully. Many were able to construct a pair of equations using the data given on the costs of text messages and voice calls. Well-prepared candidates went on to find and check the cost of each, but others made poor attempts at solutions to simultaneous equations or gave no answer. In a part question about the growth in ownership of mobile phones, common errors included failure to identify the compound percentage and use of a factor of 1.04 to find a 0.4% increase.

The extended answer question about consumption of snack foods required the drawing of a histogram, and while many candidates gained some marks, few completely correct diagrams were seen. Common errors included omission of a title or of axis labels with correct units. Many candidates omitted to use continuous linear scales. Only a small proportion of candidates correctly plotted frequency density, with most choosing to plot the frequency. Candidates in some centres showed little awareness of the correct method of finding the mean from a grouped frequency table.

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 in their answer booklet
- set out workings clearly showing the complete method used
- solve problems involving simultaneous equations
- solve problems involving scale diagrams, area and volume, and conversion between different units of measurement
- find the mean from grouped frequency tables
- choose suitable levels of accuracy and be guided by the data provided
- avoid premature rounding in multi-stage calculations
- follow the conventions used for graphical presentations, in particular titles, appropriate labelling and units, and use suitable linear scales where necessary.

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Application of Number