

Application of Number Level 3 May 2005

General Comments

Overall this paper was more challenging than those used in some recent series. Although balanced in terms of the skills coverage, the paper was demanding in the amount and complexity of information given and some candidates clearly found it difficult to understand questions and choose a suitable method for arriving at a correct solution. The paper was long, and the last two part questions were particularly poor value as they offered one mark each for quite a lot of work. The pass mark for this paper was lower than that of recent series, and the proportion of candidates achieving a pass was lower than previously.

There was a marked disparity between the performance of candidates in different centres. In some, it is clear that candidates are well prepared for the test and are working at or around the correct level; in others, the poor attempts at questions, showing misunderstanding of key concepts at this level indicate that candidates are being entered either without an adequate grasp of the underpinning knowledge as described in part A of the standards or with insufficient preparation for the test.

Questions answered successfully in the May paper involved calculating using proportions, using a formula, scaling dimensions from a map, calculating with a compound percentage and estimating a fraction. Questions involving use of trigonometry and Pythagoras' theorem, proportional difference and converting units were commonly handled well by stronger candidates, but others showed weaknesses in these areas. The weakest responses were seen on question involving finding the mean of grouped data and interpreting statistical information.

As in previous series there were numerous instances of candidates losing marks through incorrect rounding. Sometimes this was due to premature rounding part way through a multi-stage calculation leading to an inaccurate final result. In other cases, final answers were not given to a sensible level of accuracy.

Comments on Particular Aspects of the Question Paper

A question about ring tones involving calculating using proportion was fairly well done, although some candidates answered using incorrect notation or units for money, writing £0.21p or 0.21p instead of £0.21, and others misread the question and inverted the calculation. A subsequent part of this question gave a value that had increased by a known percentage and asked for the amount of the increase. This was poorly handled, with many candidates simply finding the percentage of the given value and subtracting it.

A question about a survey of speeds of cars produced few completely correct responses. Stronger candidates often used a correct method to find the mean speed of cars from a grouped frequency table, but some failed to give an answer to an appropriate level of accuracy. Many candidates showed little understanding of grouped frequency, and simply divided the total of the frequencies by the number of groups. Part questions asking for an interpretation of statistical data were also poorly handled. Some candidates correctly selected the median as the more significant of the averages given but not all could justify their choice. When asked to compare the percentages of cars obeying the speed limit in two surveys, few candidates showed understanding of the significance of the median and interquartile range.

A question about an oil tanker involving complex conversions between units was well attempted, and a fair proportion of candidates gained one or two marks on it. The most common error was a premature approximation leading to an inaccurate final result. The second part of this question asked for the area of an oil slick of a known quantity of oil and a known depth. There were few valid attempts at this, with many candidates failing to identify a correct method, or to convert metric units correctly.

In a question about beach huts, there were many correct answers to a question involving scaling of dimensions of a beach hut site, although some candidates gave answers in centimetres, which were inappropriate units for the distances involved. Others tried unsuccessfully to convert from centimetres to metres candidates by dividing by 10 or 1000. A question about a comparison of cost per square foot of two types of beach hut was fairly well answered, although some candidates lost marks through premature approximation. Few correct attempts were made at a question about the number of weeks at which a seasonal rental was cheaper than a weekly rental. Some valid attempts were seen, using trial and improvement and algebraic methods, but a common error in the latter was incorrect rounding of the final answer.

A question about primitive triangular-section dwellings was poorly answered. Some candidates did not realise that a right-angled triangle was required to use the methods they chose, others attempted to calculate the area in order to find the vertical height of the triangle. Pythagoras' theorem was often poorly applied, with addition used instead of subtraction. Some candidates applied trigonometry correctly to find the angle of slope of the roof. Common errors included incorrect rearrangement of the equation, and incorrect rounding, with answers given to several decimal places. Many candidates did successfully use a formula to find the surface area of the dwelling.

The first part of the extended answer question, requiring formulation and use of simultaneous equations, was omitted by a large proportion of candidates. Of those who attempted it, few were able to write two equations, although more found the correct solutions. Subsequent parts required candidates to interpret a table of data and a graph about the percentages of people in different age groups who smoked. Some correct conclusions were seen, but many candidates wrote about the numbers of people smoking rather than referring to percentages. Most candidates gained one or two marks on the graph, usually through correct plotting and drawing and labelling of lines. Many failed to write a title on their graph, and there were very few correct linear scales on the year axis.

Recommendations to Centres

Centres must ensure that candidates:

- enter for the level 3 test when they are sufficiently prepared
- read questions carefully to understand the problem, obtain relevant information and after finishing a question, check to see they have answered it fully
- practise breaking down complex problems into manageable steps
- choose suitable levels of accuracy and be guided by the data provided
- convert between units accurately, especially when dealing with area and volume
- interpret graphs and charts and compare distributions accurately
- calculate the mean of grouped data
- solve problems involving construction and solution of simple equations
- avoid premature rounding in multi-stage calculations
- follow the conventions used for graphical presentations, in particular titles and axis labels and appropriate linear scales

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