

Application of Number Level 3 June 2005

General Comments

The questions on this paper were set in original contexts and balanced in terms of skills, although there were slightly more questions involving percentages than usual. Overall, the paper was very demanding in terms of its length and the difficulty of some questions. The first question in particular was more complex than opening questions on some recent papers and some candidates may have found it a discouraging start to the test. The extended question was worth 24 marks in all, and some candidates appeared to have had insufficient time to attempt all parts of it. The pass mark for this paper was lower than that in recent series, and the proportion of candidates achieving a pass was lower than previously.

Candidates in some centres clearly found the paper too difficult, omitting or abandoning attempts or making basic errors which show a poor grasp of the skills at this level. This suggests that they may have been entered for the test with insufficient preparation or at too high a level.

Questions answered successfully in the June paper involved a multi-stage calculation to compare energy costs, calculating with a compound percentage and estimating a fraction. Questions involving rearrangement of a formula, converting between imperial and metric units, trigonometry and Pythagoras' theorem were often handled well by stronger candidates, but others showed weaknesses in these areas. The weakest responses were seen on questions which gave a value which had changed by a given percentage and asked for the previous value. Calculating the mean using grouped data was once again a weak area for many candidates.

Incorrect rounding was a common reason for incorrect answers; candidates did calculations using appropriate methods, but lost marks by failing to apply their results to the particular problem by giving an answer to a sensible level of accuracy. Sometimes they selected suitable methods but rounded or truncated values part way through a multi-stage calculation leading to an inaccurate final result.

Comments on Particular Aspects of the Question Paper

The opening question required candidates to obtain information from two tables and perform a multi-stage calculation involving proportional costs. Relatively few complete correct answers were seen, and many candidates omitted or abandoned the question. A common error was to use an incorrect value from the tables, or to fail to realise that the proportions for two geographical areas were different. Some candidates omitted one stage of the calculation completely, while others rounded a value part way through the calculation which led to an incorrect final answer.

A question about savings made by using solar energy was fairly well answered. Many candidates had no problem with calculating a straightforward percentage, although some misread the information given and having found the correct answer went on to do further calculations which were not required. The second part of the question was also well answered. Some candidates did the first stage of the calculation correctly, but then failed to convert pence into pounds for the final stage. Others applied the correct method but failed to round their answer correctly.

The statistics question was poorly answered. Candidates in some centres used the correct method for calculating the mean from a grouped frequency table, although there were some errors involving calculation of mid-points, and answers were sometimes given to an unsuitable level of accuracy. Many candidates showed uncertainty over the correct method to deal with grouped data; common errors seen were finding the total of the mid-points, or dividing by the number of groups. A question involving a percentage increase was done well, although some candidates divided the difference between the two values by the changed value rather than the original value, whereas others divided the changed value by the original value, found a result of 1.17 and gave an answer of 1.17% rather than 17%. A part question involving a compounded percentage was generally done well.

Problems involving conversion of units and using formulae were reasonably well handled. In the conversion of a speed from miles per hour to metres per second, a common error was to convert miles to metres using the given conversion rate, but then omit to divide by 60 x 60. Correct rearrangement and substitution into a formula was seen, but some candidates lost a mark as they did not give their answer to two significant figures as stated in the question.

The extended question was not often completed in full, but some candidates gained more marks on it than on other questions. A reasonably straightforward calculation of time caused problems to some candidates. The most common errors were incorrect subtraction of one time from another and minutes treated as decimals. Some correct answers were seen for a question asking for one value as a fraction of another. Many candidates gained one mark for correct calculation of the values, but some gave their answer as a decimal or percentage rather than a fraction, others failed to simplify the fraction. The graph question was less successfully attempted than on previous papers. Many candidates drew a time series graph for which no marks were awarded as the question asked for a scatter graph. Few titles were seen on graphs, but appropriate linear scales were often drawn. Plotting of points was less accurate than usual, with many candidates truncating the values given when plotting them. Questions involving algebra were not well answered. Some correct answers to the simultaneous equations question were seen, but few candidates successfully wrote algebraic expressions or used algebraic solutions.

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
- 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, appropriate labelling and units

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