

November Test Series 2006

Chief Examiner's Report

Application of Number

Level 3

General Comments

This test paper contained some accessible questions and others that were much more demanding, particularly question 5. Overall, the paper was balanced with regard to the skills specified in part A of the Application of Number standards. As in recent series, candidates were allowed 15 minutes reading time prior to starting the test. There was little evidence to suggest that this was used to good effect, and a substantial proportion of the candidates did not complete the final question. The extended answer question itself was shorter than on previous papers, but in the paper as a whole there were several questions which were complex and will have taken a good deal of time to answer. However, there was ample opportunity for candidates who were well prepared for the test to gain the marks required for a pass.

The pass mark was similar to previous series, but the proportion of candidates obtaining a pass mark was relatively low. Although there were fewer candidates with very low scores than in previous series, many candidates failed to answer questions correctly, either through incorrect choice of method, or through errors in calculation. Rounding continues to be a common reason for incorrect answers; candidates fail to choose a suitable level of accuracy for final answers, or more commonly they round values part way through multi-stage calculations and obtain incorrect final results.

The questions answered most successfully were those involving percentages, calculating using proportion and using a formula. Questions involving complex multi-stage calculations, conversions from imperial to metric units and calculating the mean using grouped data were often handled well by stronger candidates, but others showed weaknesses in these areas. The weakest responses were seen on questions involving checking answers, simultaneous equations, and calculating volume.

Comments on Particular Aspects of the Question Paper

Most candidates obtained some correct answers on the first question of the paper, about text messages. Although it involved large numbers, the question was accessible and required relatively straightforward calculations, and would have provided an encouraging start to many. Not all candidates took advantage of this, and errors caused by incorrect choice of method for percentage increase and reverse percentage problems were often seen.

A question about a cylindrical oil pipeline was well answered by stronger candidates. While many were able to find the radius and length of the pipeline, they failed to use dimensions in consistent units in the formula. Part questions about the number of tankers that can be filled per year by the pipeline, and the expected life of the oil reserve were generally well answered, although some candidates seemed unsure of the number of days in a year.

In a question about sales of publications, most candidates recognised the need for fraction in the form $\frac{a}{b}$, but some failed to give the answer in a simple form, while others did not approximate as stated in the question. In a part question about the value of sales per employee, a common error was to reverse the calculation, or to omit the millions given in the column heading of the data table.

The trigonometry question required some care to answer, particularly with regard to the choice of values to use from the diagram, and several instances of incorrect substitution were seen. Most candidates correctly chose to use the tangent, but some were unsure how to rearrange the equation to find the length of the side of the triangle, whereas others incorrectly chose to use the inverse tangent. Many candidates used formulae to find an average speed and the surface area of a sphere, although some failed to give a useful approximate ratio based on their results.

Question 5 opened with a complex multi-stage calculation involving scaling dimensions, conversion between metric and imperial units and finding the area of a trapezium. While all of these should be well within the capability of a candidate entered for this test, few were able to identify a method leading to a correct solution. A common error was to find the area before scaling up the dimensions, and then apply the scale factor only once. Other errors involved an incorrect choice of operation to do the conversion or an incorrect choice of method for finding the area. Questions involving writing and using simultaneous equations were unpopular as in previous series, and few correct attempts were seen.

Most candidates were able to interpret two time-series graphs on charity donations in the final question, and many correct answers were seen to a part question on the percentage of total charity donations made by 16-24 year-olds. Most candidates who attempted the graph question obtained some marks, but few completely correct graphs were seen. Common errors included omission of a title, incorrect labelling of axes or incorrect scales. Calculating the mean from a grouped frequency table proved challenging. Many candidates showed uncertainty over the correct method to deal with grouped data; common errors seen were finding the total of the mid-points instead of the sum of fx , or dividing by the number of groups. Questions involving the interpretation of the results of statistical calculations were completed reasonably well by those who attempted them. Most candidates were able to explain why the mean from the grouped frequency data was only an estimate, and to choose the median as the better average for the purpose given, although few were able to explain their reason clearly.

Recommendations to Centres

Centres must ensure that candidates:

- enter for the level 3 test when they are sufficiently prepared
- 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
- practise breaking down complex problems into manageable steps
- calculate the mean of grouped data
- solve problems involving construction and solution of simple equations
- 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 using titles, appropriate labelling and units.

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