



## **General Certificate of Education**

# **Applied Science**

## **8771/8773/8776/8779**

**SC05      Choosing and Using Materials**

# **Report on the Examination**

*2009 examination - June series*

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## General Comments

The majority of candidates attempted every part of every question.

As in the past, the standard of mathematical calculations was disappointing. Candidates should be encouraged to attempt all calculations: in many cases marks are awarded for selecting the correct equation or for providing the correct units, even if the arithmetic is incorrect.

It was also disappointing to find that those questions involving straightforward recall of standard definitions were poorly answered by many candidates.

Many candidates were careless in their wording. For example, describing a composite as a mixture of *one* or more materials or an alloy as a mixture of *one* or more metals. A number of candidates stated that metals should be *non-corrosive*.

### Question 1

The concept of bonding and linking bonding / structure to properties is not being grasped by the majority of candidates. The answers to this question were on the whole disappointing, for what should have been a gentle introduction to the paper.

### Question 2

Apart from the less able candidates, most did quite well on this question though there were many contradictory reasons in the answers to parts (b) and (c).

### Question 3

- (a) Some fundamental properties of particular metals have not been understood by many candidates – quite a number believed that the high reactivity of gold and silver prohibited their use as coinage metals.
- (b)-(d) These sections were poorly answered by all but the most able candidates.
- (e) The answers to this section were very much centre-dependent. The candidates from a select few centres answered this question well. However, the majority of candidates showed little or no knowledge of the heat treatment of metals.

### Question 4

- (a) Despite being told to ignore density the majority of candidates answered this question in terms of the lead 'weighing the scuba diver down'.
- (b) Some novel methods of determining density were seen. Quite a few candidates thought that observing the increase in water level alone gave the density. However, a lot of candidates scored full marks on this question.
- (c) This calculation was generally well done with a lot of candidates scoring full marks. The unit mark was not gained by some candidates – the most common error being  $\text{kgm}^3$ . A few candidates thought that density = mass  $\times$  volume.
- (d) This section was poorly answered by all but the most able candidates.

### Question 5

- (a) Very few good answers. The definition of a polymer should be straightforward recall but few candidates knew it. In part (ii) a large number of candidates described the properties of polymers (e.g. do not conduct) rather than the wider issues intended in the question.
- (b) A number of candidates believed they were measuring strain. Most candidates managed to score in the region of 2 to 5 marks with some obtaining full marks.  
A large number of candidates wrote about fair and reliable testing in part (b)(i) but failed to answer (b)(ii) or (b)(iii) with any conviction. Better examination technique would have helped here. Centres should encourage candidates to read through the whole question before starting to answer it.
- (c) Many candidates thought that Plastic A was cross linked. Not one candidate produced a correct response to part (c)(iii).

### Question 6

- (a) Most candidates scored well on the graph question.  
A lot of candidates did not know the difference between the x-axis and the y-axis.
- (b)-(c) Generally well answered but many candidates wrote 'yield point' instead of elastic limit for (c)(ii).
- (d) Poorly answered by many candidates. In part (i) most candidates read the stress from the graph as 60 rather than  $60 \times 10^6$ . The Young Modulus calculation in part (ii) still presents a problem to many candidates despite it being a well established question.

### Question 7

This was not a particularly high scoring question for the majority of candidates. Only one candidate knew the meaning of the term 'macromolecular'. It is recommended that centres practice the comprehension questions with their candidates using past papers and mark schemes.

## **Mark Ranges and Award of Grades**

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