



General Certificate of Education

Applied Science **8771/8773/8776/8779**

SC05 Choosing and Using Materials

Report on the Examination

2009 examination – January series

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General Points

The majority of candidates attempted every part of every question. As in the past, the standard of mathematical calculations was disappointing. It was also disappointing to find that those questions involving straightforward recall of standard definitions were poorly answered by many of the candidates. It is recommended that candidates should learn definitions.

Question 1

Most candidates scored around half marks on this question. A pleasing number of candidates obtained full marks. Many failed to realise that only 6 lines had to be drawn.

Question 2

- (a) The majority of candidates answered this question from the point of view of an alloy rather than a pure metal.
- (b) Very few candidates obtained full marks for this question. Most scored 1 or 2 marks.
- (c) The majority of candidates obtained full marks for this question.
- (d)(i) Very few candidates scored on this question. The majority of answers referred to the trucks being able to travel faster and the bridges being cheaper to build.
- (d)(ii) A lot of answers described malleable rather than ductile.
- (d)(iii) A good response to this question with nearly all candidates stating that the statue is resistant to corrosion.
- (e) A lot of answers made a simple reference to 'cost' rather than 'high cost' or expensive.
- (f) This part of the question was poorly answered by all candidates.

Question 3

- (a)(b)
&(c) Very few candidates answered these questions in terms of the 'grain' i.e. wood is weakest across the grain, plywood is strong because the grains in adjacent sheets are at right angles and chipboard has no grain.
- (d) Most candidates could state two reasons why GRP is preferred to wood. A lot of answers referred to GRP as a material that did not 'corrode'.
- (e)(i) Very few candidates scored full marks on the graph question. Many candidates did not know the difference between the x -axis and the y -axis.
Only a very few candidates drew the graph as a curve. The vast majority seemed to think that a line of best fit always has to be a straight line.
- (ii) Most candidates could describe the trend shown in the graph.

(iii) Only a very small number of candidates realised that to determine the tensile strength of the plastic it was necessary to extrapolate the graph back to the tensile strength axis (i.e. % of glass = 0) and read the value.

(f)(i)

&(ii) Most candidates scored 1 or 2 marks on these questions.

Question 4

(a)

&(b) Very few candidates scored any marks on these questions.

(c)(i)

&(ii) Almost all candidates calculated the rise in temperature of the rod but not all realised that the expansion of the rod was obtained by subtracting the micrometer readings.

(iii) Very few candidates realised that the expansion of the rod and its original length had to be expressed in the same units in order to carry out this calculation.

(d) Only a very small number of candidates answered this question correctly.

(e)(i)

(ii)(iii) The majority of candidates found these calculations difficult.

(iv) Most candidates scored marks on this question. A few candidates thought that the bridge would expand because of the heat generated by the traffic.

(f) Only a minority of candidates were able to correctly label the positions of copper and iron on the bimetal strip.

(g)(i) Only a few candidates scored 2 marks on this question. Guess-work rather than reasoning seemed to be the order of the day here.

(ii) Most candidates thought that the gap between the contacts had to be smaller for the thermostat to operate at a lower temperature.

Question 5

(a)(i) A very small number of candidates made no attempt at this question. Most candidates scored between 2 and 4 marks but described an experiment to test tensile strength rather than stiffness.

(ii) Most candidates obtained the mark for repeating the experiment but only a few candidates scored a second mark.

(iii) Most candidates did not obtain this mark because their experimental design did not test stiffness.

(b) Most candidates knew the relationship between the size of the Young modulus for a material and its stiffness.

- (c) Only a very small number of candidates realised that the Young modulus for copper was one third of the value for steel. Most candidates trebled steel's value.
- (d)(i) Most candidates knew why strain has no units.
- (ii) A pleasing number of candidates carried out the Young modulus calculation successfully. However, many of them lost a mark for not including units in their answer.
- (e) Only a very small number of candidates knew that the larger the gradient of a stress - strain graph the stiffer the material.

Question 6

On the whole this question was very poorly answered. Candidates who scored marks did so in parts (a) to (e). It was disappointing to see that very few candidates could provide correct definitions of basic terms (synthetic, amorphous and polymer).

Parts (f) to (j) of this question were not attempted by a significant number of candidates and where an attempt was made scores of 0 or 1 were common.

It is recommended that candidates should practise comprehension questions using those from past papers.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the [Results statistics](#) page of the AQA Website.