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Examiners' Report/ Principal Examiner Feedback

Summer 2012

GCE Engineering

Unit 6931_01

Engineering Materials, Processes and Techniques

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Question 1

In most instances candidates were able to state a specific material, however when it came to the properties of those materials, many candidates gave responses that were very generic and not very technical. For example, the examiner was looking for words such as ductile or elastic etc., and in many cases these were not presented. There were a number of repeat answers in the significant property element which were not credited.

Question 2

This question tended to be quite well executed by the majority of candidates. However, in a number of instances in the precaution/control element, candidates did repeat themselves in a number of instances.

Question 3 (a)

In this question the majority of candidates scored well. They were able to identify ‘copper’ and were able to explain the reasons for their choice.

Question 3 (b)

This question was similarly responded to as 3(a). The majority of candidates identified ‘urea formaldehyde’ and they were able to present some sound explanations.

Question 3 (c)

The correct response for (i) in this question was *brass*. A good number of candidates responded with copper. However, where this was presented, in answer for (ii), many candidates did give reasons such as ‘conducts electricity well’. Many candidates missed out on the mark in (i) but did achieve a mark for a suitable answer in (ii).

Question 3 (d)

The majority of candidates did identify the correct material and gave sound explanations as to why that material would have been used.

Question 4 (a)(i)

Very few candidates achieved the full three marks in this question. Candidate answers were difficult to follow and it was clear that a good number did not know how a piece of wire would be crimped to a connecting lug.

Question 4 (a)(ii)

It was clear from the responses that candidates had undertaken soldering. However, it appears that they found it difficult to put it down onto paper. Candidates achieving the maximum mark were in the minority.

Question 4 (b)

This question was, on the whole successfully completed. The benefits of permanent joints were stated satisfactorily.

Question 5 (a)

Very few candidates answered (i) correctly. The majority restated the question saying that it 'made the metal harder'. However, most candidates were able to describe how carbon steel is hardened. By not answering element (i) correctly, candidates were unable to gain the maximum mark in element (ii).

Question 5 (b)

Very few candidates new the purpose of tempering carbon steel and very few could adequately explain the process. Most knew that it was a heat process but very few were able to describe how oxide colours are used to determine the temperature at which to cool the metal. Again by not answering element (i) correctly, candidates were unable to gain the maximum mark in element (ii).

Question 5 (c)

The majority of the candidates knew the purpose of annealing and were then able to go on and describe the process. This question was answered well by candidates.

Question 6 (a)

Very few answers to this question commented on the pattern being made in half and then held together by pins. Candidates did refer to the pattern being made of wood which was correctly credited. Many candidates referred to the sand casting process in this section.

Question 6 (b)

Many candidates were able to identify both the runner and riser. However, not many could correctly identify the cope and drag. In some instances candidates incorrectly named the cope and drag the wrong way around on the sketch provided.

Question 6 (c)

Candidates were able to describe the sand casting process in great detail. The majority of candidates gained maximum marks when answering this question.

Question 6 (d)

The vast majority of candidates answered this question correctly. There were no issues with the making of the pattern larger than required.

Question 6 (e)

Most candidates were able to answer this question. Some did say “thermoplastic” which was not accepted and some suggested one of a number of thermosetting plastics. It was of some concern that a number believed that thermosetting plastics could be vacuum formed.
As far as 6(a)(ii) was concerned, there were a number of responses that only warranted one mark. Be aware that an explain question should have two elements to allow the two marks to be awarded but a good number only had one element such as ‘the plastic has a low melting point’.

Question 7 (a)

The majority of candidates were able to identify a correct specific material that could be used in vacuum forming.
It was clear that the majority of candidates were familiar with the vacuum forming process and because of this, were able to explain that a thermoplastic would be used, as the plastic needs to be able to be heated and formed and then left to cool down retaining the desired shape. This question on the whole was reasonably attempted.

Question 7 (b)

Candidates were able to describe and explain the vacuum forming process using notes and sketches. A limited number of candidates only used notes or a sketch, and because of this could not access all the marks available. Candidates were specifically asked to use both forms of communication.

Question 8

Candidates were able to produce a wide variety of designs and the majority of candidates achieved marks towards the higher end of the scale.

Question 9

Candidates were in the main able to evaluate the difference between the two materials as to their suitability for the casing. In conclusion, they were also able to recommend one of the materials with detailed argument. As this question assesses the quality of written communication, candidates should be encouraged to write in sentences and paragraphs and not provide answers in tabular form.

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