

Examiners' Report/
Principal Examiner Feedback

Summer 2013

GCE Engineering

Unit 6931_01

Engineering Materials, Processes and
Techniques

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UNIT 6931

Engineering Materials, Processes and Techniques

Question 1

This question tended to be quite well answered by the majority of students. However, in the precaution/control element students did repeat themselves in a number of instances. If this happened then credit was only awarded once. There were many students who could not distinguish between thermoplastic and thermosetting polymers reducing the ability to gain maximum marks.

Question 2

In most instances students were able to state a specific material, however when it came to the properties of those materials, many students 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 3 (a)(i)

In this question the majority of students scored well. They were able to list many advantages for this process.

Question 3 (a)(ii)

This question was similarly responded to as Question 3(a)(i). The majority of students were able to identify disadvantages for this process.

Question 3 (b)

Students answered this question to different levels of ability. Only a small number of students achieved full marks for this question, with a large number of students achieving no marks. There were a number of answers relating to press work of sheet metal.

Question 4 (a)(i)

Approximately 50% of the students were able to give a correct definition for ductility.

Question 4 (a)(ii)

Seventy five per cent of the students who responded were able to correctly give the meaning of elasticity.

Question 4 (a)(iii)

The majority of students who responded were able to give the meaning of malleability.

Question 4 (a)(iv)

Approximately 50% of students were able to state a correct definition for hardness.

Question 4 (a)(v)

Approximately 50% of students were able to state a correct definition for toughness.

Question 4 (b)(i)

Approximately 50% of students were able to state the effect of removing the load between points 'A' and 'B'.

Question 4 (b)(ii)

Approximately 15% of students were able to correctly identify the plastic range.

Question 4 (b)(iii)

The majority of students were able to state what happened to the test piece at point 'E' on the graph.

Question 4 (b)(iv)

Approximately 50% of students were able to correctly state the critical point labelled 'D' on the graph.

Question 5 (a)(i)

Many students were able to state normalising relieves internal stresses.

Question 5 (a)(ii)

Students were able to say that the metal should be heated to a certain temperature, but a number of students just stated 'heat the metal up' without a comment regarding to what temperature. Students who did not qualify a temperature were not awarded any marks.

Question 5 (b)(i)

The majority of students were able to state case hardening increases the hardness of the outer layer of the metal.

Question 5 (b)(ii)

Same comment as Question 5(a)(ii) regarding temperature of metal to be heated.

Question 6 (a)(i)

Majority of students were able to state two applications where spot welding would be used in manufacturing. Some students identified applications where the material was too thick to spot weld such as steel girders.

Question 6 a)(ii)

Students were able to demonstrate two arms coming together to complete an electric circuit. However there were a number of answers where sketches showed only one arm in the process without qualification. Very few students were able to state materials were fused together or molten material solidifies to form the joint.

Question 6 (b)

There were a number of students who could not distinguish the difference between permanent and temporary methods of joining. Incorrect answers included welding, soft soldering, brazing and the use of adhesives.

Question 7 (a)(i)

Students were able to identify a number of different materials that can be electroplated onto mild steel.

Question 7 (a)(ii)

Students were able to provide factors why mild steel should have a protective coating.

Question 7 (b)

Students were able to identify the main parts of the electroplating process including anode, cathode and electrolytic solution. Answers also included the use of electricity to compliment the process.

Question 8

Students were able to produce a wide variety of designs and the majority of students achieved marks towards the higher end of the scale. Some student sketches were minute in size, which were very difficult to view and identify information on designs. In future students should be encouraged to draw reasonably sized sketches.

Question 9

Students 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. A number of students referred to different materials not in the question provided. Students discussed materials such as aluminium which reduced their ability to gain the higher marks available. As this question assesses the quality of written communication, students should be encouraged to write in sentences and paragraphs and not provide answers in tabular form.

Grade Boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:

<http://www.edexcel.com/iwant to/Pages/grade-boundaries.aspx>

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