

Examiners' Report/
Principal Examiner Feedback

Summer 2016

Pearson Edexcel GCE in
Engineering (6931)

Unit 2: Engineering Materials,
Processes and Techniques

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Question 1

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. If this happened then credit was only awarded once.

Question 2

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. The examining team did not accept answers such as strong or tough as individual statements. To achieve the marks candidates were expected to make statements such as 'strong in compression'.

Question 3 (a)

In this question the majority of candidates scored well. They were able to identify 'stainless steel' as the most suitable material for a roller bearing and were able to explain the reasons for their choice. Where the candidates answered with an incorrect material, one mark was awarded for a suitable explanation for the incorrect material identified.

Question 3 (b)

This question was similarly responded to as 3(a). The majority of candidates identified poly vinyl chloride and they were able to present some sound explanations. Where the candidates answered with an incorrect material one mark was awarded for a suitable explanation for the incorrect material identified.

Question 3 (c)

The correct response for (i) in this question was urea formaldehyde. A number of candidates responded with an incorrect answer. However, where this was presented, in (ii), many candidates did give suitable explanations to achieve one mark. Many candidates missed out on the mark in (i) but did pick up a mark in (ii). A number of candidates correctly identified UF as the correct answer but offered unsuitable explanations for the use of this particular material. Many candidate answers for (ii) referred to UF as an insulator against electricity. This answer was marked incorrect by the examining team as a control knob would not be connected to electricity. The examining team were looking for answers such as 'easily moulded to make complex shapes' or 'low cost so cheap to replace'.

Question 4 (a)

The majority of candidates were able to show the difference between a male and female mould.

Question 4 (b)

Many candidates were able to explain the purpose of 'gelcoat' in the GRP process.

Question 4 (c)

Many candidates were able to explain the purpose of a 'release agent' in the GRP process.

Question 4 (d)

Many candidates were able to explain the purpose of 'glass fibre matting' in the GRP process.

Question 5 (a)

Some candidates were able to access the majority of marks with good detailed explanations and sketches of the drop forging process. However, there were a number of candidates who described forging on an anvil with a hand held hammer which received no marks.

Question 5 (b)(i)

Candidates were able to explain the purpose of hardening the cold steel chisel.

Question 5 (b)(ii)

Candidates were able to explain the purpose of tempering the cold steel chisel.

Question 5 (b)(iii)

Candidates were able to explain the purpose of only heat treating one end of the cold chisel.

Question 6 (a)(i)

The majority of candidates were able to provide two advantages and one disadvantage of the anodising process when applied to metal.

Question 6 (a)(ii)

The majority of candidates were able to provide two advantages and one disadvantage of the galvanising process when applied to metal.

Question 6 (a)(iii)

The majority of candidates were able to provide two advantages and one disadvantage of the painting process when applied to metal.

Question 6 (a)(iv)

The majority of candidates were able to provide two advantages and one disadvantage of the plastic coating process when applied to metal.

Question 6 (b)

Most candidates were able to explain advantages of using self-finishing materials.

Question 7 (a)

The majority of candidates answered this question poorly, incorrectly identifying the exact positions of the plastic deformation area, the elastic limit and the ultimate tensile strength.

Question 7 (b)(i)(ii)(iii)

Candidates were able to perform mathematical calculations using the values and formulae provided. However with answers (i) and (ii) many answers contained incorrect units. Where this happened, only one mark was available to the candidates. Again, for (iii) answers that included units, were also only able to access one mark.

Question 8

Candidates were able to produce a wide variety of chassis designs to the specification and the candidates achieved marks across the whole mark range.

Question 9

Candidates were in the main able to evaluate the advantages and disadvantages identifying the difference between pressing the material into shape or the vacuum forming processes. There were differing degrees of candidates relating to the materials, performance requirements and finishing.

In conclusion, they were also able to recommend the most suitable process 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 or bullet form.

