Examiner's Report
Principal Examiner Feedback

Summer 2017

Pearson Edexcel GCE
In Engineering (6931)
Paper 01
Engineering Materials, Processes and Techniques

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Question 1

In most instances candidates were able to state a specific class of 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 examining team were looking for responses 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 2

This question tended to be quite well answered 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 3 (a)

In this question the majority of candidates scored well. They were able to identify 'copper' as the most suitable material for the electric cables 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 'rubber' as the most suitable material for the tyre of the dumper truck 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 (c)

This question was similarly responded to as 3(a and b). The majority of candidates identified 'cast iron' as the most suitable material for the engine block 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 (d)

This question was similarly responded to as 3(a, b and c). The majority of candidates identified 'low carbon steel' as the most suitable material for the axle 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 4 (a)

The majority of candidates were able to explain why hardness and toughness are important properties in the smooth running of the crankshaft. The examining team were looking for answers relating to the crankshaft, i.e. the crankshaft needs to be tough in the body to resist torque or twisting under rotation. No marks were awarded for generic answers such as the crankshaft needs to be tough without an explanation.

Question 4 (b)

Candidates provided suitable answers to a hardness test for low carbon steel. Suitable diagrams relevant to the hardness test stated were provided by the candidates. Candidates provided good answers for this question.

Question 4 (c)

Many candidates were able with the aid of diagrams explain the difference between tensile and compressive strength.

Question 5 (a)

Many candidates were able to access the majority of marks with good detailed explanations and sketches how the frying pan is manufactured.

Question 5 (b)

Candidates were able to explain why aluminium is a suitable material for the body of the frying pan. However, there were some candidate answers that related to corrosion. The examining team did not award marks for corrosion as it decided there was little risk of corrosion in a household kitchen.

Question 5 (c)

Candidates were able to provide good detailed explanations of why a thermosetting polymer was used for the frying pan handle. Accompanying diagrams suitably explained the difference between thermosetting and thermoplastic polymers.

Question 6

The answers to this question provided a wide range of marks from the candidates. Revolving around the manufacture of the hammer head on a centre lathe poor answers discussed using a three jaw chuck instead of a four jaw chuck. Candidates obtaining the higher marks discussed using a four jaw chuck and were also able to transfer the skill of bench tapping to centre lathe tapping.

Question 7

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

Question 8

Candidates were in the main able to evaluate the advantages and disadvantages and identifying the difference between using mild steel or aluminium alloy for the outer body of the dumper truck. There were differing degrees of candidate answers relating to the materials, performance requirements and ease of manufacture relating to the outer body of the dumper truck.

In conclusion, they were also able to recommend the most suitable material 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.