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Examiners' Report/ Principal Examiner Feedback

Summer 2014

Pearson Edexcel GCE Engineering

Unit 6931_01

Engineering Materials, Processes and Techniques

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UNIT 6931

Engineering Materials, Processes and Techniques

Question 1
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 brittle or elastic etc., and in many cases these were not presented. 'Strong' was another term often used but not credited with marks as the examiner was looking for 'strong in compression/tension'. 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 answered by the majority of students. However, in a number of instances in the precaution/control element, students did repeat themselves. If this happened then credit was only awarded once.

Question 3 (a)
In this question the majority of students scored well. They were able identify a suitable material for the sprocket with an explanation for the reason that material had been identified.

Question 3 (b)
In this question the majority of students scored well. They were able identify a suitable material for the brake block with an explanation for the reason that material had been identified. A number of students incorrectly identified PVC as a suitable material.

Question 3 (c)
In this question the majority of students scored well. They were able identify a suitable material for the spokes with an explanation for the reason that material had been identified.

Question 3 (d)
In this question the majority of students scored well. They were able identify a suitable material for the insulation around the power cable with an explanation for the reason that material had been identified. A number of students incorrectly identified rubber as a suitable material.

Question 4 (a)
The majority of students were able to identify a permanent joint on the bicycle.

Question 4 (b)
Students were able to state two advantages of using the permanent joint identified.

Question 4 (c)
Students were able to state two disadvantages of using the permanent joint identified.

Question 4 (d)
Some students were able to describe using notes and sketches, the MIG welding process. A high number of students however described the electric arc process.

Question 5 (a)
Many students were able to state the type of turning as eccentric or off-centre.

Question 5 (b)
Students were able to either describe the operation of a three-jaw or four-jaw chuck but many answers did not explain the operating differences between both types of work holding devices.

Question 5 (c)
Students were able to describe using notes and sketches, to different levels of expertise, how an operator would set up the centre lathe to manufacture the spigot.

Question 5 (d)
Many students were able to describe using notes and sketches the procedure for setting the tool height on a centre lathe.

Question 6 (a)
Majority of students were able to name a thermosetting polymer but some students named a thermoplastic polymer.

Question 6 (b)
Majority of students were able to name a thermoplastic polymer but some students named a thermosetting polymer.

Question 6 (c)
Majority of students were able to describe the molecular structure and features of a thermosetting polymer.

Question 6 (d)
Majority of students were able to describe the molecular structure and features of a thermoplastic polymer.

Question 6 (e)
Students were able to explain how ultra violet light can degrade some polymers and the effect the degradation can cause to the properties of polymers.

Question 6 (f)
The question was poorly answered with many students not being able to describe the galvanic corrosion process.

Question 6 (g)
Students were able to explain why shape memory alloys could be used to operate a cut-off switch.

Question 7
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 8
Students were in the main able to evaluate the difference between the two materials as to their suitability for the bicycle frame. 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. 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/iwantto/Pages/grade-boundaries.aspx

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