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Principal Examiner Feedback

Summer 2010

GCE

GCE Engineering
Unit 1: Paper 6931 01
Engineering Materials, Processes and Techniques.

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Principal Examiner's Report - GCE Engineering 6931

Responses showed a broad appreciation of the subject matter. There were however some misunderstandings which led to reduced marks in some questions as shown below.

Comments on Individual Questions:

Question 1:
Responses showed good knowledge of Classes of Materials with significant properties. Learners still quote "strong" as a property possessed by almost any material.

Question 2 (a):
Good general knowledge of hazards, risks and control measures with few misunderstandings.

Question 2 (b):
Most learners showed sound knowledge of the principles of soldering but many lost marks by describing the general idea of soldering but not the process.

Question 2 (c):
Although the learners understood the process of etching many did not know what liquid was used as the etchant, sulphuric acid or just acid were favourites.

Question 3 (a):
This question was responded to reasonably well. The majority of candidates had some knowledge of the injection moulding process and were able to describe and illustrate the process. This was probably due to the fact that this process is covered well in Design and Technology at Key Stage 3. The best responses included all the internal elements of the injection moulding machine and were able to put across to the examiner that they had a full understanding of the complete process. A number of candidates did not describe the industrial process but described a method of injection moulding using syringes. This method was probably observed during lesson demonstrations.

Question 3 (bi):
Learners understood the process of annealing copper but many omitted the final stage, pickling.

Question 3 (bii):
Learners understood the process of case hardening, but many did not know the purpose of the process. Many wrote that it was just to harden the metal.

Question 4 (a):
Learners displayed sound knowledge the properties of copper.

Question 4 (b):
Although learners chose the correct insulating material, PVC, few gave flexibility as a reason for the choice.

Question 4 (c):
Although learners chose the correct materials for the chuck few gave durability or suitability for machining as reasons for the choice. Most realised that the high tensile strength was a key property.

Question 5 (a):
This question was, in the main, answered satisfactorily. The majority of candidates were able to discuss the importance of ease of manufacture and that the component parts would need to be inserted efficiently during the manufacturing process. They were also able to discuss the issue of ease of access to undertake repairs to the drill should there be a failure of one of the internal components.

Question 5 (b):
Drill case: learners acquired the marks very easily even though explanations were not easy to read or understand. Some gave similar answers to both questions 5a and 5b.

Question 5 (c):
Learners scored the required marks quite easily but most ignored the structural weakness produced by UV and even fewer realised that the material can turn into a powder.

Question 6 (a):
The majority of learners understood the iron content of the steel was responsible for corrosion but few realised that both oxygen and water were required. No answers related corrosion to electrolytic action.

Question 6 (b):
Answers were generally muddled and many stated the function of the piezo-electric actuator in reverse.

Question 6 (c):
This was one of those questions that was either very well done, or very poorly done. The best responses clearly showed that these students had clearly been taught the process of laying up GRP. They were able to explain the manufacturing from the mould and release agent to the removal of the product from the mould. The weaker candidates had little understanding of the making of a glass fibre product and were unable to explain any rewardable responses.

Many just described laminating without relating it to the rest of the process. Omission of the gel coat and not allowing to cure were the most common errors. Too many answers included heating in various forms.

Question 7 (ai):
The main reason for loss of marks was confusion between anode and cathode. Boiling the work piece, adding the dye and protecting with lacquer did not feature in many answers.

Question 7 (aii):
Learners had a general understanding of the process but missed out vital details such as cleaning and cooling.

Question 7 (b):
The 2 marks were easy to obtain in this question, most candidates stating that it saved time and money.

Question 8:
The responses in this question were very disappointing. It was evident that many candidate had not read the question and the responses presented were very simplistic. Many of the suggestion would not have worked with little understanding of such factors of leverage and mechanical advantage. Many of the solution would not have worked and a good number were far below GCE level. It was evident that many candidates had little understanding of engineering principles.

The level of marks achieved in this question was normally below 6 (less than half)
The sketches were generally poor and explanations difficult to read and understand.
A contributing factor to the poor achievement could have been the lack of space given on the paper for this question. This lack of space led to the production of the poor quality answers in many cases.

Question 9:
This question was levels marked and was, on the whole satisfactorily undertaken. The majority of the candidates were able to put across sound reasons as to why aluminium or ABS might be suitable materials for the drill case. However, there were some "misunderstandings". A large number of students suggested that aluminium would not be suitable as it rusts. In some cases the answers were in note form. Some learners stated a preference for ABS and just listed the advantages with little reference to aluminium

Statistics

Grade Boundaries 6931 – June 2010

Grade	Max. Mark	A	B	C	D	E
Raw Boundary Mark	90	65	57	49	42	35
UMS	100	80	70	60	50	40

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