

Version 1.



**General Certificate of Secondary Education  
June 2012**

**Engineering (Double Award) 48503**

**(Specification 4850)**

**Unit 3 Application of Technology**

***Report on the Examination***

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## **General**

### General Comments

The examination paper allowed learners to demonstrate their knowledge of drawing techniques and planning. They were also able to explain their understanding of manufacturing processes, surface finishing and the application of technologies.

It was pleasing to note that the vast majority of learners attempted all the questions on the paper. The communication skills shown by the learners were varied and sometimes made marking quite challenging.

The learners' understanding of flowcharts as a means of process planning was encouraging and most demonstrated a workable sequence of events.

The learners' knowledge of the manufacturing and finishing processes was generally very good, whilst their understanding of the application of technologies gave rise to a mixed response.

A significant number of learners found the questions on pneumatics and electronic components quite challenging. Many had no concept of a piston in a cylinder connected to an air supply. These concepts can be taught with the aid of a simple bicycle pump. Also few demonstrated a sufficient understanding of what a micro-controller is, or what it does in common domestic appliances.

The learners' knowledge of engineering materials was very mixed. Many gave accurate responses to the questions but a significant number could not give a definition of a Composite material. These materials are fundamental to modern engineering and impact upon everyone's daily lives.

Generally learners seemed to be well prepared for the examination, apart from the question relating to pneumatics and micro-controllers.

### **Question 1 (a)**

This question was not well answered with most candidates failing to score any marks.

### **Question 1 (b)**

The majority of candidates was able to give the meaning of at least one of the abbreviations or symbols but few scored more than 2 marks.

### **Question 1 (c)**

This question was generally well answered with a variety of situations where these types of drawings may be used. However a significant number cited "to be able to see inside something". This statement in itself was not accepted as engineers have a perfect solution by using "hidden detail".

### **Question 2**

A very well answered question that most learners were able to gain over 8 marks.

### **Question 3 (a)**

This question was very well answered with almost all learners demonstrating a good understanding of the process and gaining significant marks.

### **Question 3 (b)**

Many could not state an alternative ferrous metal for the bracket. However, most could state the properties of a galvanised low carbon steel to make it suitable for the bracket.

### **Question 3 (c)**

This question was not answered as expected. The specification mentions Go/No Go gauges but very few learners gave these in their answers. However many cited Jigs, moulds together with a suitable explanation and were awarded full marks.

### **Question 4 (a)**

This was generally well answered although a few answered Mill or Router despite the Note in the question. A good range of processes was evidenced in the answers.

### **Question 4 (b)**

The question was very well answered, with most learners able to give a satisfactory response.

### **Question 4 (c)**

This question was very well answered with a majority of candidates scoring 5 marks, and a pleasing number achieving the maximum 6 marks available.

### **Question 5 (a)**

This question was generally well answered, with most learners satisfactorily comparing the two strategies and their effect upon the environment. Most gained a mark for the QWC

### **Question 5 (b) (i)**

This question was very well answered with the majority of learners being able to define what is meant by a sustainable energy source.

### **Question 5 (b) (ii)**

This question was very well answered, almost all learners gained full marks.

### **Question 5 (c)**

This question had a mixed response with the explanations. Some lost marks due to the QWC.

### **Question 6 (a)**

Most candidates were able to score at least 1 mark on this question.

### **Question 6 (b)**

This question was not so well answered with many learners unable to explain how the single acting cylinder works. It was apparent that many had met this topic for the first time. Centres should note that pneumatics is a fundamental element in engineering processes and control and needs to be adequately addressed.

### **Question 7 (a) (i)**

This question was also not well answered with many learners unable to give an adequate explanation of a micro-controller.

### **Question 7 (a) (ii)**

This question was fairly well answered with most learners able to give a suitable example.

### **Question 8 (a)**

This question was fairly well answered. Most learners could state that CIM encompassed the entire manufacturing process but many did not fully explain what that involved in sufficient detail.

### **Question 8 (b) (i)**

This question was not well answered, with many learners unable to give a satisfactory explanation as to what is meant by a “composite” material. This was disappointing as these materials are being developed on an almost daily basis and are at the forefront of engineering design and technology. It would be expected that students of engineering at this level would have a basic understanding of the classifications of engineering materials.

### **Question 8 (b) (ii)**

This question was very well answered. It was encouraging to note that many of the learners could at least name a composite material.

### **Question 8 (b) (iii)**

Again in this question many learners gave satisfactory answers.

## **Mark Ranges and Award of Grades**

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