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# **EXAMINERS' REPORTS**

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**LEVEL 1 / LEVEL 2 AWARD IN  
ENGINEERING**

**JANUARY 2021**

Grade boundary information for this subject is available on the WJEC public website at:  
<https://www.wjecservices.co.uk/MarkToUMS/default.aspx?l=en>

### **Online Results Analysis**

WJEC provides information to examination centres via the WJEC secure website. This is restricted to centre staff only. Access is granted to centre staff by the Examinations Officer at the centre.

### **Annual Statistical Report**

The annual Statistical Report (issued in the second half of the Autumn Term) gives overall outcomes of all examinations administered by WJEC.

## ENGINEERING

### Level 1/Level 2 Award

January 2021

#### UNIT 3: SOLVING ENGINEERING PROBLEMS

##### General Comments

Most candidates attempted all of the questions on the paper but, in a number of cases, there was evidence of candidates not having read questions carefully before answering. It is most important that candidates take the time to read through the question paper before attempting to answer questions, as this can help to ensure that basic errors are avoided. Detailed knowledge of basic engineering terminology remains limited in many cases.

- Q.1**
- (a) (i) Most candidates were able to successfully list an advantage of using CAM to manufacture the parts.
  - (a) (ii) Most candidates were able to successfully list a disadvantage of using CAM to manufacture the parts.
  - (b) This question was not well answered in most cases. A high number of candidates struggled to list two properties/characteristics of HIPs that make it a suitable material to manufacture the scratch plate.
  - (c) This question was not well answered in most cases, with the majority of candidates unable to demonstrate their understanding of the word 'ergonomics'. A number of candidates read the question as being related to 'economics', and mentioned financial considerations, instead of answers related to sizes and how the guitar fit with parts of the user's body.
  - (d) This question wasn't answered well. The majority of candidates could not explain why a wood effect composite was used to manufacture the main body of the amplifier.
  - (e) This question was answered very well. Candidates were able to identify a suitable material for the wheels, as well as justifying their choice.
  - (f) (i) This question was answered well. Most candidates correctly identified the switch and amplifier, as well as with their purpose in the circuit. A number of candidates didn't correctly identify the variable resistor.
  - (f) (ii) Responses to this question were good. Candidates were able to use notes and sketches to explain the process of soldering in detail.
- Q.2**
- (a) It was pleasing to see that this question was answered very well by most candidates. The most popular responses including – the bollards can be raised and lowered electronically, and reflective strips/reflective material can be attached to the bollards.

- Q.2**
- (b)** This question was answered fairly well, with most candidates being able to list two health and safety points to be considered when designing modern bollards. Answers related to motorists and pedestrians being able to see the bollard in both day and night, and pedestrians being injured by the bollards.
  - (c)** Responses to this question were very good. Candidates were able to evaluate describe two specification points a design engineer would have to consider when designing a bollard. The more popular points related to the material used and the size of the bollard.
  - (d)** This question was generally answered well. Candidates were able to evaluate how using recycled plastics can lessen the environmental impact. There were many good answers, including reduce the amount of waste going to land-fill, and less use of raw material (oil) to manufacture new plastics.
- Q.3**
- (a)**
    - (i)** Very few candidates were able to name the welding machine in this question. Without knowing what the engineering equipment is, it is very difficult to write a description of its use. Some candidates incorrectly named the second tool as a 'vice'. The correct name for the tool is a 'machine/drill vice'. However, most candidates were able to write a description of its use, and were not penalised twice for the error.
    - (ii)** The majority of candidates successfully identified the first safety sign as a warning to wear safety goggles. The second safety sign was not identified as being a 'laser hazard/laser in use. Incorrect answers included 'danger of sparks/explosions'.
  - (b)**
    - (i)** This question was answered very well by the majority of candidates. Most candidates were able to calculate the total length of mild steel required to manufacture the bird table.
    - (ii)** This question was answered very well by the majority of candidates. Candidates were able to use their answer from part (i) to calculate the cost of manufacturing one bird table.
    - (iii)** The majority of candidates successfully calculated the cost of the mild steel with a 20% reduction in the cost.
  - (c)** Most candidates answered this question well. Most drew the folding bars in isometric, using the grid paper. A high number showed a clear space between the bars, and drew it in the correct proportion. Some were able to draw the bars to a very high quality.



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