

Surname	Centre Number	Candidate Number
First name(s)		2



## GCE AS/A LEVEL

2603U10-1



**MONDAY, 13 MAY 2024 – AFTERNOON**

## DESIGN AND TECHNOLOGY – AS unit 1

### Product Design

2 hours

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	8	
2.	8	
3.	8	
4.	8	
5.	8	
6.	40	
<b>Total</b>	<b>80</b>	

### ADDITIONAL MATERIALS

A calculator, ruler, pencil and coloured pencils.

### INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

You may use a pencil for graphs and diagrams only.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided in this booklet. If you run out of space, use the additional page at the back of the booklet, taking care to number the question(s) correctly.

### INFORMATION FOR CANDIDATES

The number of marks is given in brackets at the end of each question or part-question. You are advised to divide your time accordingly.

The total number of marks available is 80.

You are reminded of the need for good English and orderly, clear presentation in your answers.

The quality of your written communication, including appropriate use of punctuation and grammar, will be assessed in your answer to question 5.



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Answer **all** questions.

1. Jigs are commonly used in the manufacture of products like the clothing rail shown below.



- (a) Describe the meaning of the term 'jig' and explain the benefits to the manufacturer of using a range of jigs in a production run. [4]

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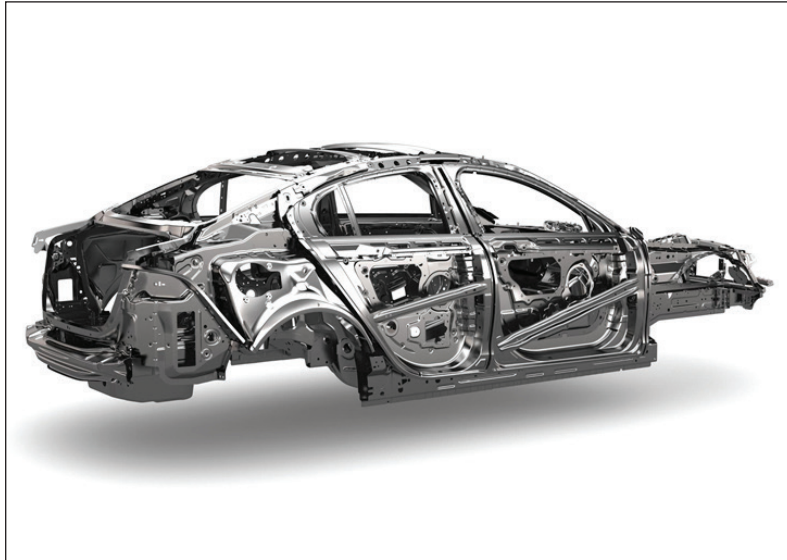
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- (b) Select a part of the clothing rail. Using annotated sketches, design a jig that could be used for manufacturing the part. [4]



2. The car body below is manufactured from an aluminium alloy.



(a) Explain the meaning of the term 'alloy'.

[2]

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(b) Explain the benefits for the manufacturer and consumer of using an aluminium alloy for the car body.

[6]

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3. Ergonomics is an essential consideration in the design of road crossings like the one shown below.



Explain how ergonomic principles have been considered in the design of the:

(i) Pathway

[4]

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(ii) Button control unit

[4]

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4. The environmental footprint is a critical consideration when packaging products.



**Product A**

**440 g**

**Tin coated steel can with printed paper label**



**Product B**

**200 g per pot**

**PET pot with printed card package**

Describe how the material used in the products pictured contributes to their environmental footprint. [8]

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6. (a) Design a prototype space-saving collapsible stool for a young child. The space-saving collapsible stool is to be manufactured in plywood using a CNC machine.

**Specification**

The design of the stool must:

- be a creative design that would appeal to a 3 to 5-year-old child
- have a seat height of 300mm
- be easily assembled and dis-assembled
- make innovative use of plywood sheet
- be safe and stable
- be portable and lightweight.

You are required to use a mixture of 2D and 3D annotated sketches.

Marks will be awarded for:

- |                                                              |     |
|--------------------------------------------------------------|-----|
| (i) An innovative design that meets the specification above. | [6] |
| (ii) Clear constructional details.                           | [4] |
| (iii) The inclusion of appropriate dimensions.               | [2] |
| (iv) The quality of communication.                           | [4] |



Use the space below for your idea.

Note: You are not expected to render, colour or shade your design.





(e) Discuss:

(i) The benefits of user-centred designing for the extension of the range of stools to an adult market. [4]

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(ii) How creative thinking strategies could be employed when extending the range of stools into the adult market. [4]

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**END OF PAPER**



