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National
Qualifications
2024

Mark

X819/75/01

Design and Manufacture

WEDNESDAY, 1 MAY

1:00 PM – 2:45 PM



* X 8 1 9 7 5 0 1 *

Fill in these boxes and read what is printed below.

Full name of centre

Town

Forename(s)

Surname

Number of seat

Date of birth

Day

Month

Year

Scottish candidate number

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Total marks — 80

SECTION 1 — 60 marks

Attempt ALL questions.

SECTION 2 — 20 marks

Attempt ALL questions.

Write your answers clearly in the spaces provided in this booklet. Additional space for answers is provided at the end of this booklet. If you use this space you must clearly identify the question number you are attempting.

Use blue or black ink.

Before leaving the examination room you must give this booklet to the Invigilator; if you do not, you may lose all the marks for this paper.



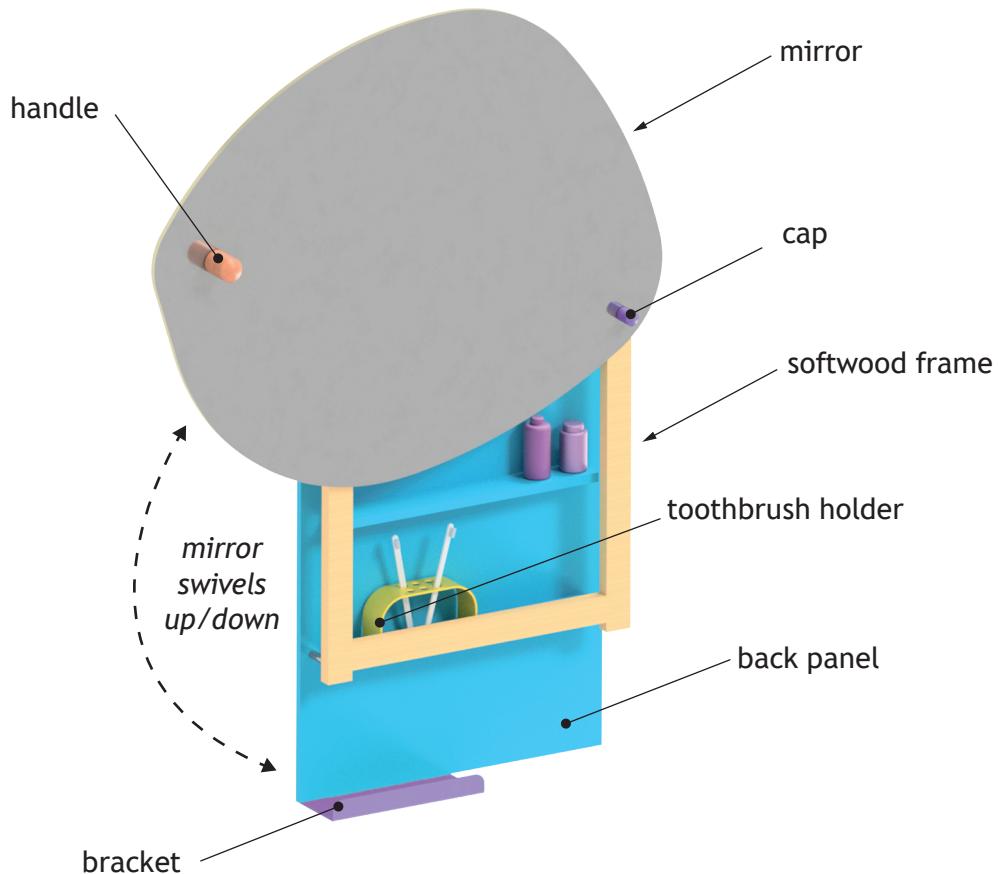
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SECTION 1 — 60 marks

Attempt ALL questions

1. A design proposal for a bathroom cabinet with a rotating mirror is shown below.



- (a) The back panel was made from a manufactured board.

- (i) Name a suitable smooth manufactured board for the back panel.

1



1. (a) (continued)

(ii) Outline two benefits of using manufactured boards.

2

[Turn over



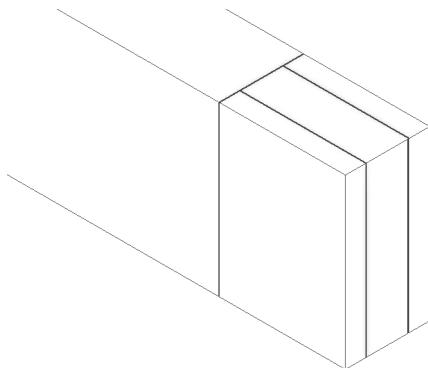
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1. (continued)

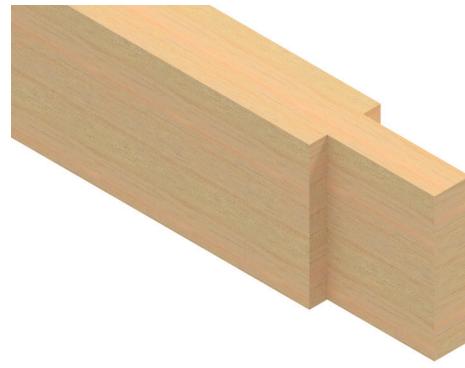
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- (b) The mirror was attached to a softwood frame.

Mortise and tenon joints were used to join the sides of the frame together.



tenon marked out



tenon after being cut

- (i) Describe how to **mark out** the tenon, with reference to workshop tools.

3

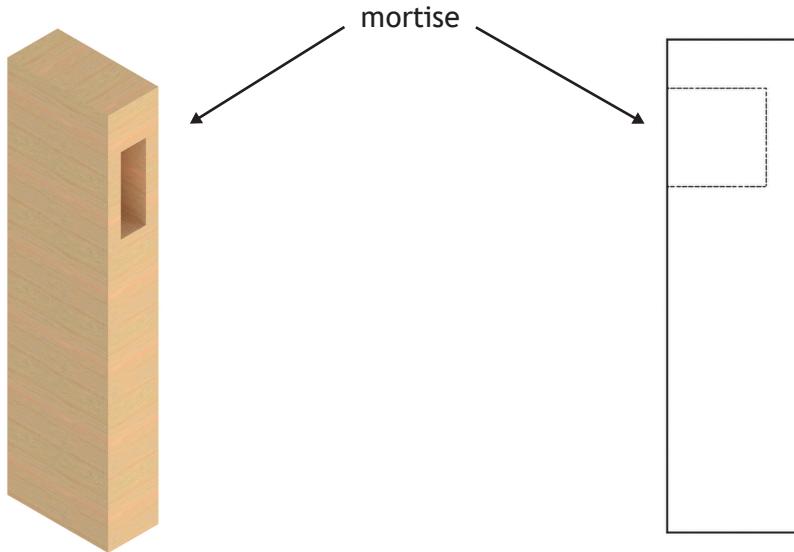
You may use sketches to illustrate your answer in the box below.



* X 8 1 9 7 5 0 1 0 4 *

1. (b) (continued)

The mortises were cut to a depth of 30mm using the mortise machine.



- (ii) Outline two ways to ensure the mortises were cut to the correct depth. 2

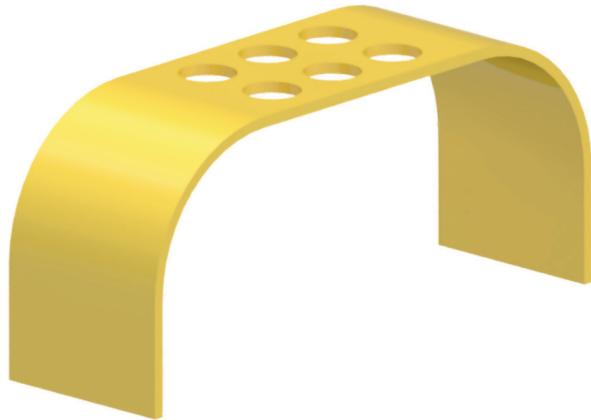
- (iii) Name an alternative woodwork joint for the softwood frame. 1

[Turn over



1. (continued)

- (c) An acrylic toothbrush holder was included inside the bathroom cabinet.



- (i) Name a suitable drill bit that could be used to make the holes.

1

- (ii) Explain why the toothbrush holder should be drilled **before** forming into the curved shape.

1

- (iii) Outline **two** safety checks that should be carried out on the pillar drill prior to drilling.

2



* X 8 1 9 7 5 0 1 0 6 *

1. (c) (continued)

- (iv) Describe the stages used to form the curves in the acrylic toothbrush holder, with reference to workshop tools/equipment.

3

You may use sketches to illustrate your answer in the box below.

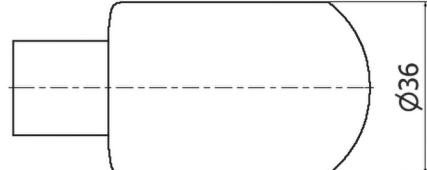
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* X 8 1 9 7 5 0 1 0 7 *

1. (continued)

- (d) The handle was made from a hardwood blank and turned to the shape shown below.



- (i) Name a suitable hardwood for the handle.

1

- (ii) Name a turning process carried out to reduce the diameter of the handle.

1

- (iii) Name the tool used to check the diameter of the handle.

1

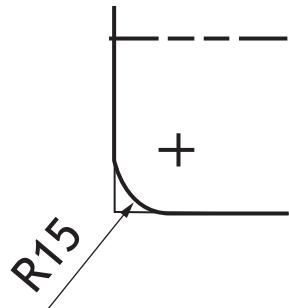
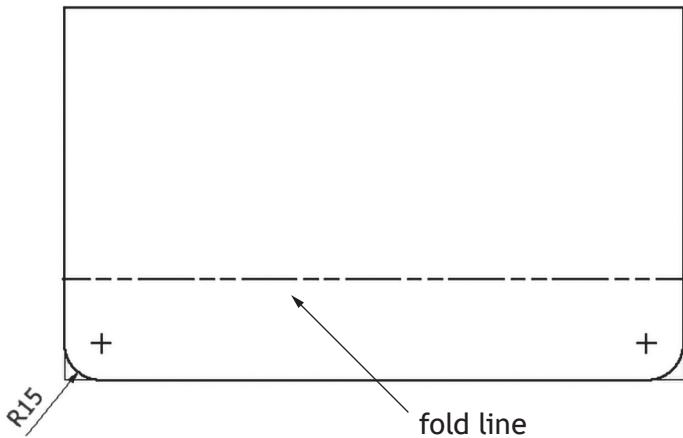
- (iv) Outline two ways of ensuring a high-quality finish on the handle when using the wood lathe.

2



1. (continued)

- (e) The bracket was marked out on a sheet of mild steel as shown below.



- (i) Describe how to mark out the rounded corners, with reference to workshop tools.

3

You may use sketches to illustrate your answer in the box below.



* X 8 1 9 7 5 0 1 0 9 *

1. (e) (continued)

The bracket was bent to shape as show below.



- (ii) Describe how to form the bend on the mild steel bracket, with reference to workshop tools.

2

You may use sketches to illustrate your answer in the box below.



1. (e) (continued)

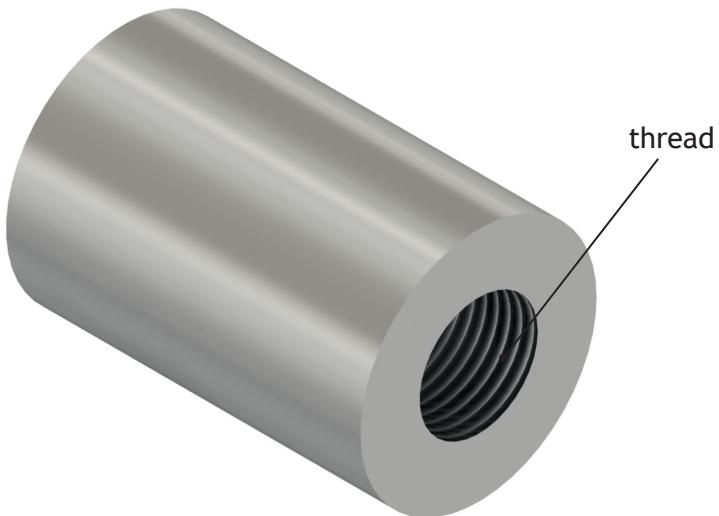
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Paint was applied to the mild steel bracket.

- (iii) State **two** benefits of using paint to finish the bracket.

2

- (f) An internal thread was cut inside the cap.



Describe **two** ways of ensuring a good quality thread is cut, with reference to workshop tools and equipment.

2



2. A ring light and stand are shown below.



Research techniques such as user trips can be used to evaluate products.

Outline **three** features of the ring light and stand that could be evaluated by carrying out a user trip.

3



* X 8 1 9 7 5 0 1 1 2 *

3. Designers often use idea generation techniques to help them create new designs.

A table from one of these techniques is shown below.

Material	Colour	Theme	Number of legs
Wood	Primary	Space	4
Plastic	Secondary	Under the sea	1
Metal	Contrasting	Plants	3

- (a) Name the idea generation technique that would use this type of table.

1

- (b) Name an alternative idea generation technique.

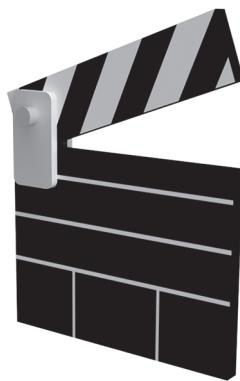
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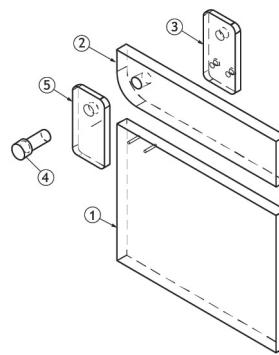


* X 8 1 9 7 5 0 1 1 3 *

4. Graphics used in the design of a clapper board are shown below.



rendered pictorial



exploded view

You must give different reasons for (a)(i) and (a)(ii).

- (a) (i) Outline two reasons why a designer would use a **rendered pictorial** in the design process.

2

You may refer to the graphic shown above.

- (ii) Outline two reasons why a designer would use an **exploded view** in the design process.

2

You may refer to the graphic shown above.



4. (continued)

A scale model was used in the design of the clapper board.



- (b) (i) Explain two reasons why scale models are used in the design process.

2

You may refer to the model shown above.

- (ii) Name an alternative modelling technique that could be used in the design process.

1

[Turn over



5. A gaming chair is shown below.

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You must give different examples for (a) and (b).

- (a) Describe how **function** may have influenced the design of the gaming chair.

4



* X 8 1 9 7 5 0 1 1 6 *

5. (continued)

A gaming wheel and pedals are shown below.



- (b) Describe how **ergonomics** may have influenced the design of the gaming wheel and pedals.

4

[Turn over



* X 8 1 9 7 5 0 1 1 7 *

6. An outdoor play tent and trampoline are shown below.



- (a) Describe the **aesthetic aspects** of the outdoor play tent and trampoline.

3



* X 8 1 9 7 5 0 1 1 8 *

6. (continued)

- (b) Describe how the outdoor play tent and trampoline have been designed with fitness for purpose in mind.

2

[Turn over



* X 8 1 9 7 5 0 1 1 9 *

7. Marketing techniques are used to influence sales.

- (a) Name **two** marketing techniques that could be used to influence sales.

2

There are many people who influence the design of new products, each with a different role.

- (b) Complete the table shown below. The first row has been done for you.

3

Person influencing design	Role
Marketing teams	research the market, to identify needs and wants of potential consumers
	generates ideas to meet the specification
Retailers	
	use their money to purchase products



SECTION 2 — 20 marks

Attempt ALL questions

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8. A wide range of materials can be found in a kitchen.



Different reasons must be given for the suitability of each material.

- (a) (i) Outline two reasons why stainless steel is a suitable material for the splashback.

2



- (ii) Outline two reasons why melamine formaldehyde is a suitable material for the layer covering the chipboard worktop.

2



* X 8 1 9 7 5 0 1 2 1 *

8. (continued)

The cutlery tray in the kitchen drawer was vacuum formed.



- (b) State **two** features that would identify that the cutlery tray has been vacuum formed.

2



8. (continued)

The garlic press shown below has been die cast.



- (c) Outline **two** reasons why die casting is a suitable process for manufacturing products such as the garlic press.

2

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9. Designers and manufacturers should consider ways to make products more environmentally friendly.

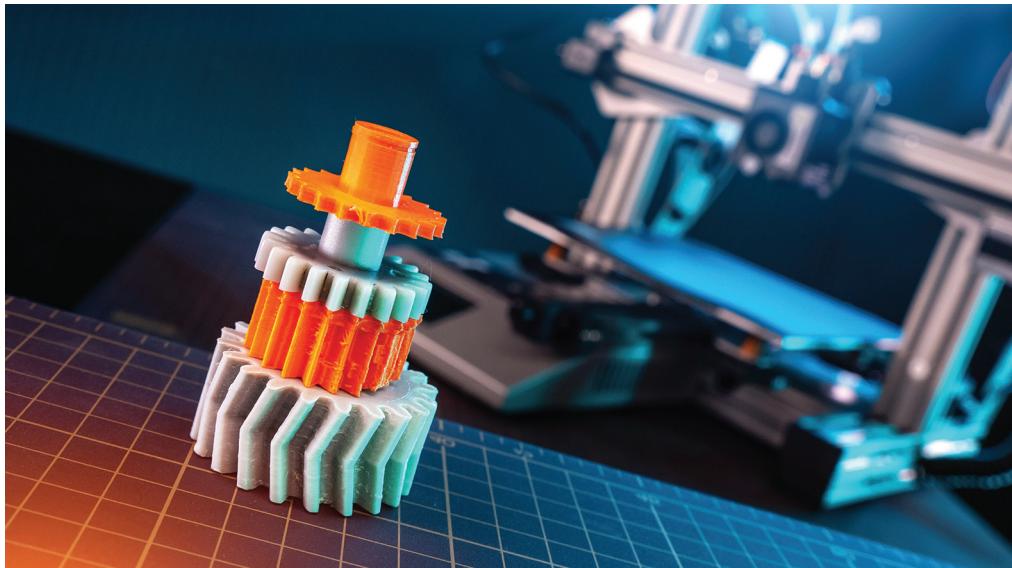


Outline **four** ways in which designers and manufacturers could reduce the impact of their products on the environment.

4



10. 3D printers are often used to manufacture products.



Outline the benefits of using a 3D printer to create products.

3

[Turn over



* X 8 1 9 7 5 0 1 2 5 *

11. A mass manufacturing factory is shown below.



Standard components are often used in the mass manufacture of products.

- (a) Outline **two** benefits of using standard components in products.

2



11. (continued)

- (b) Describe the impact of mass manufacturing on society and the workforce. **3**

[END OF QUESTION PAPER]



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