



FOR OFFICIAL USE

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National
Qualifications
2025

Mark

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X819/75/01

Design and Manufacture

TUESDAY, 13 MAY

1:00 PM – 2:45 PM



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

--

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.

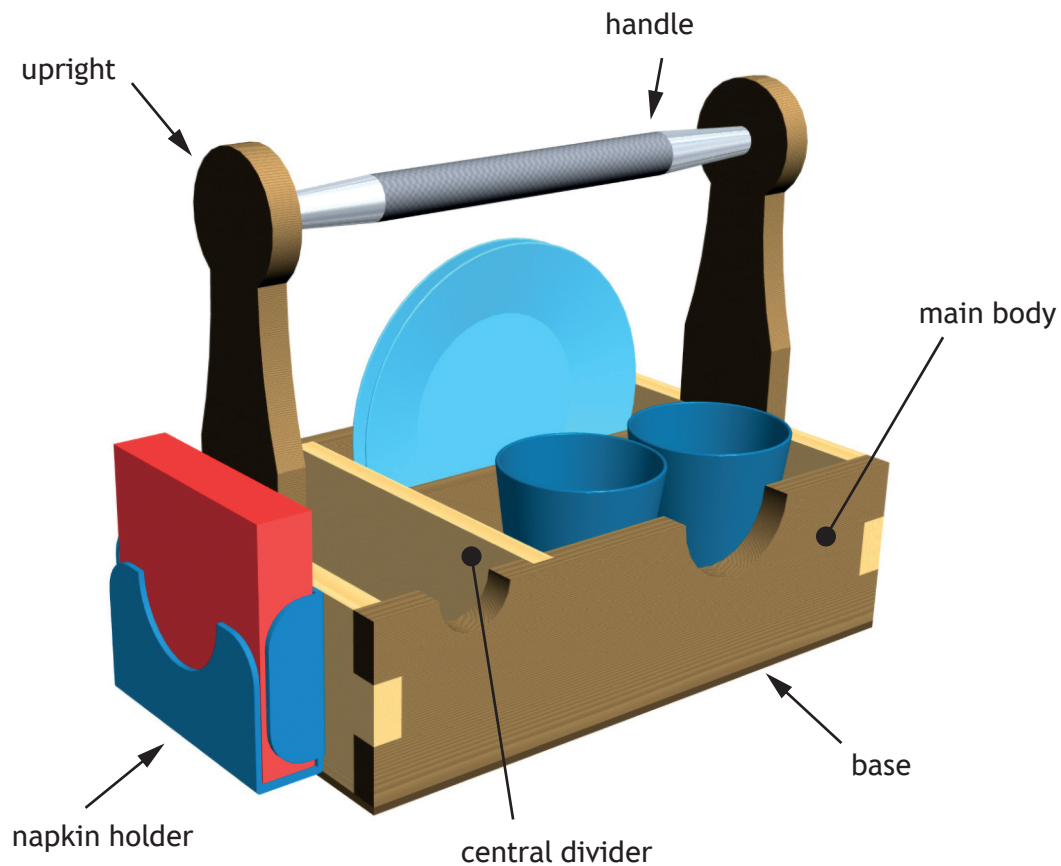
Before leaving the examination room you must give this booklet to the Invigilator; if you do not, you may lose all the marks for this paper.



SECTION 1 — 60 marks

Attempt ALL questions

1. A design proposal for a picnic caddy is shown below.



- (a) The base of the picnic caddy was made from a manufactured board.

- (i) Name a suitable manufactured board for the base.

1

Oak was used for the main body of the picnic caddy as it is strong and durable.

- (ii) State **one** other reason why oak is a suitable wood for the main body.

1

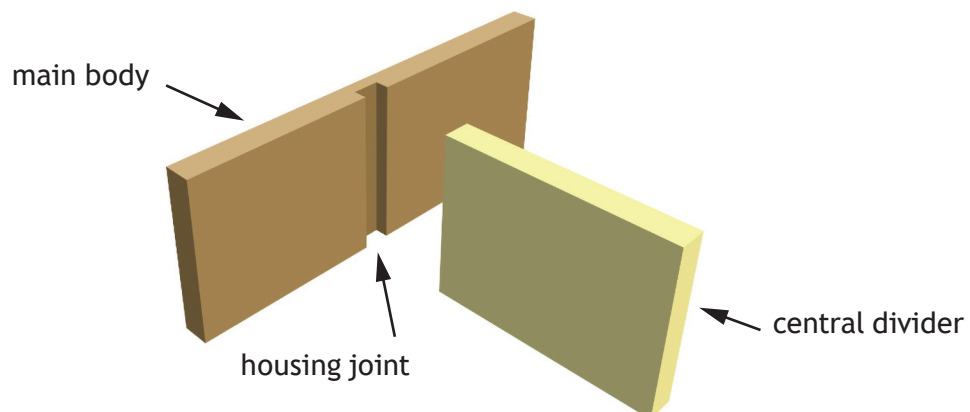
- (iii) Name an alternative hardwood that could be used.

1



1. (continued)

(b) The central divider was connected to the main body using housing joints.



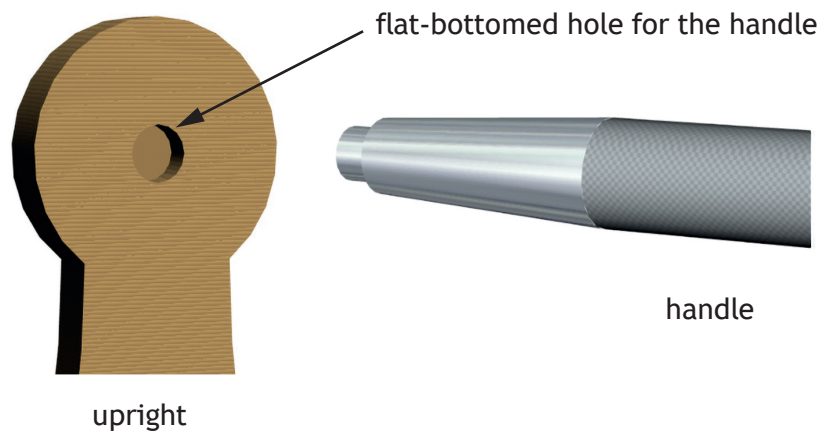
Describe how the housing joint could be marked and cut out accurately, with reference to workshop tools.

4

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

1. (continued)

(c) An exploded view of the upright and handle is shown below.



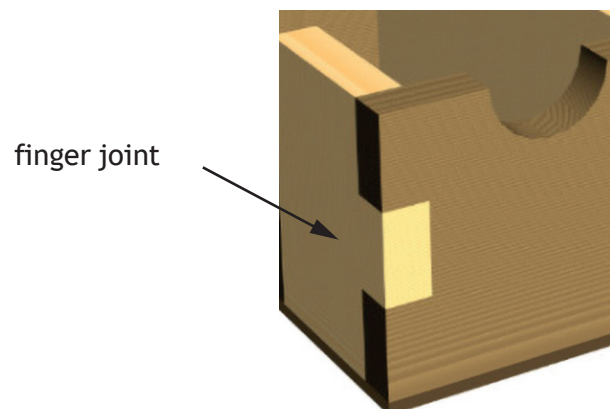
(i) Name the drill bit that could be used to create the flat-bottomed hole.

1

(ii) Outline how to ensure the hole is drilled to the correct depth.

1

(d) A finger joint was used to join the corner of the main body.



(i) Name **two** alternative joints that could be used for the corners.

2

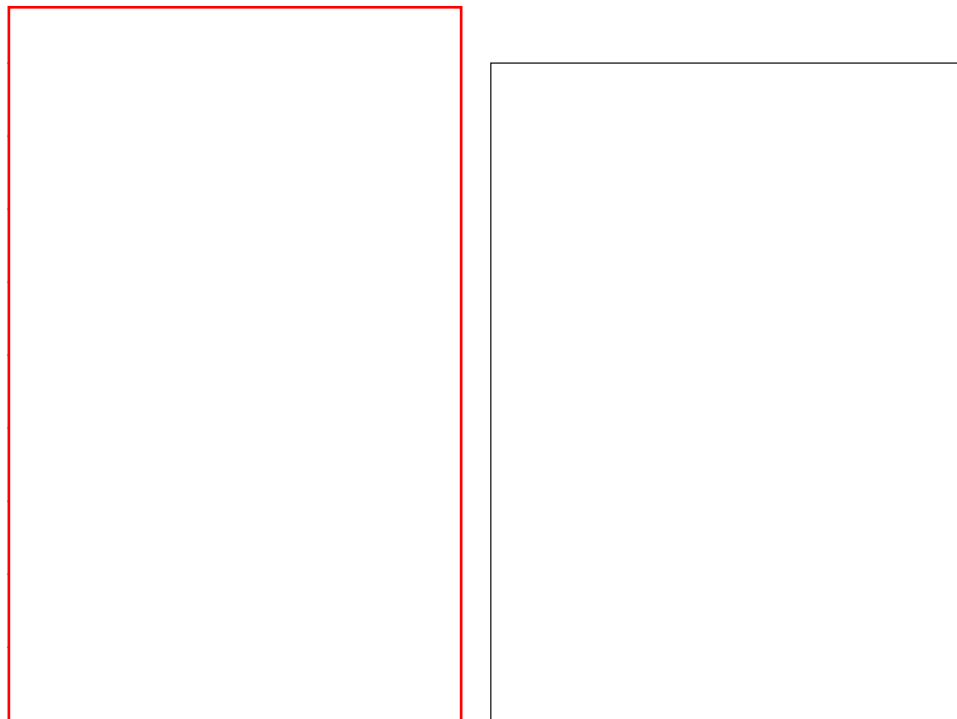
1. (d) (continued)

During assembly the main body was checked for squareness.

- (ii) Outline **two** methods of checking the main body is square.

2

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



- (e) The picnic caddy was varnished.

- (i) Outline **two** benefits of using varnish on the picnic caddy.

2



[Turn over



1. (e) (continued)

The wooden surfaces of the picnic caddy were sanded and prepared prior to varnishing.

- (ii) Describe how to ensure a high-quality brushed finish when applying varnish, **after** the surfaces are sanded and prepared.

3



[Turn over for next question

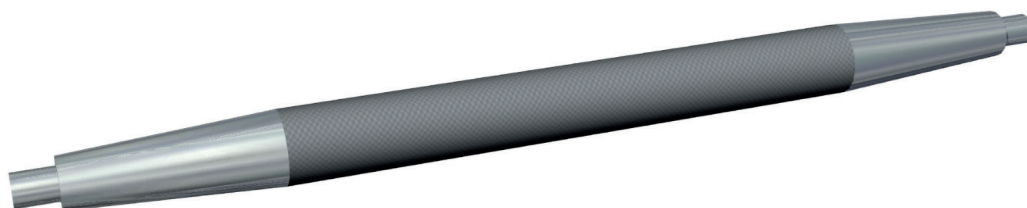
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* X 8 1 9 7 5 0 1 0 7 *

1. (continued)

- (f) A silver non-ferrous metal was used for the handle.



- (i) Name a suitable silver, non-ferrous metal for the handle.

1

The handle was turned on a centre lathe.

- (ii) Outline **two** safety checks that must be carried out on the centre lathe **before** turning.

2

1. (f) (continued)

The end of the handle is shown below.



(iii) Name the centre lathe process used to create the features at each step.

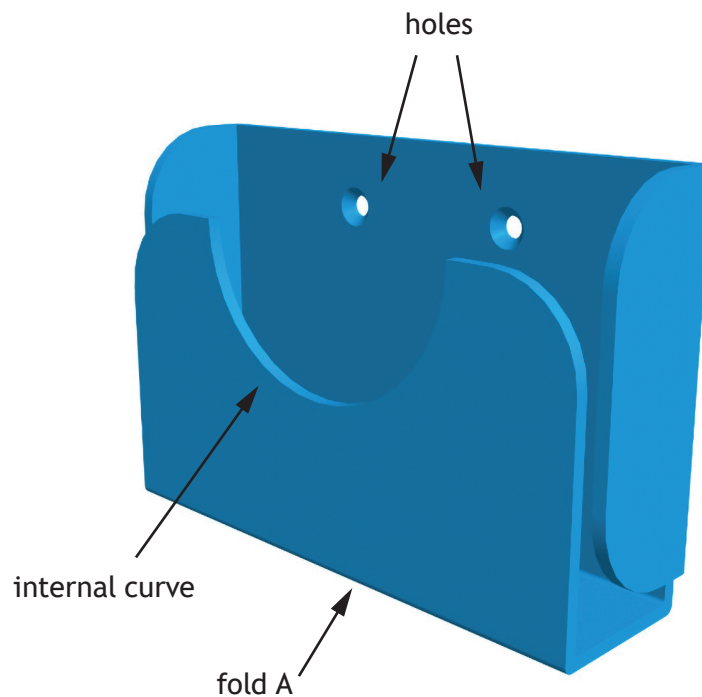
3

STEP	PROCESS
1 	
2 	
3 	

[Turn over

1. (continued)

(g) The napkin holder was made from acrylic.



An internal curve was cut on the front of the napkin holder.

- (i) Name an appropriate hand tool that could be used to cut the internal curve.

1

A countersink drill was used to create the holes on the napkin holder.

- (ii) Explain why countersunk holes were used.

1

1. (g) (continued)

The edges were finished before bending the napkin holder.

- (iii) Describe the stages used to obtain a good finish on the edges of the acrylic prior to bending, with reference to workshop tools and equipment.

2

A number of 90° folds were made to create the acrylic napkin holder.

- (iv) Describe how fold A on the napkin holder could be made, with reference to workshop tools and equipment.

2

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

2. Designers use research techniques such as questionnaires to produce a specification.



- (a) Describe the key stages of a questionnaire.

3

- (b) Name an alternative research technique that could be used.

1

- (c) Explain why a specification is used during the design process.

1

3. The designer used brainstorming as an idea generation technique.

Describe the key stages of brainstorming.

3

[Turn over



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

4. Modelling techniques are used throughout the design process.
Two modelling techniques are shown below.



Sketch model



Block model

Different benefits must be given for parts (a) (i) and (a) (ii).

- (a) (i) Describe the benefits of using sketch models in the design process.

2

- (ii) Describe the benefits of using block models in the design process.

2

4. (continued)

Graphic techniques are also used throughout the design process.

- (b) (i) Describe **two** benefits of using computer generated graphics.

2

- (ii) Outline **two** pieces of information that can be gained from a working drawing.

2

[Turn over



5. An activity toy for children is shown below.



Designers use aesthetics to attract the target market to their product.

(a) Outline the aesthetic features of the activity toy which would appeal to children.

4

5. (continued)

Designers also consider safety and maintenance issues when developing products.

You must give different issues for (b) and (c).

- (b) Outline **one** maintenance issue which would have been considered in the design of the child's activity toy.

1

- (c) Outline **three** safety issues which would have been considered in the design of the child's activity toy.

3

[Turn over



6. A hair dryer and accessories are shown below.



- (a) Describe how ergonomics may have influenced the design of the hair dryer and accessories.

4

6. (continued)

Companies expanding into new market areas rely heavily on brand image.

(b) Describe **two** benefits of a strong brand image.

2

[Turn over



SECTION 2 — 20 marks
Attempt ALL questions

MARKS

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7. Two children's rocking horses are shown below.



Different reasons must be given for parts (a) (i) and (a) (ii).

- (a) (i) Outline **two** reasons why polypropylene is a suitable material for the modern rocking horse.

2



7. (a) (continued)

- (ii) Outline **two** reasons why brass is a suitable material for the traditional rocking horse stirrups.

2



A number of manufacturing processes were used in the production of the rocking horses.

You must give different responses in (b) and (c).

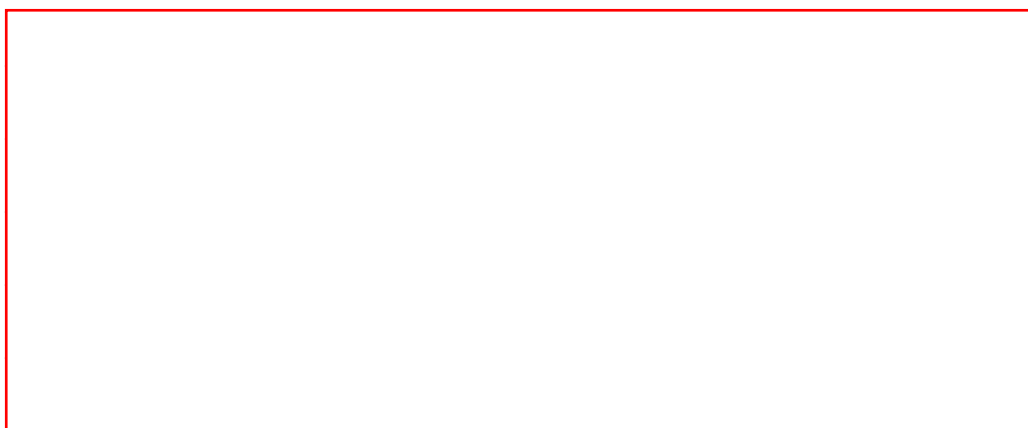
- (b) Outline **two** reasons why rotational moulding is a suitable process for mass manufacturing the modern horse.

2



- (c) State **two** identifying features that would show the stirrup of the traditional horse was sand cast.

2




8. Products can be manufactured in different volumes using methods such as one-off production or mass manufacture.



- (a) Outline **two** reasons why one-off products may cost more to manufacture than mass produced products.

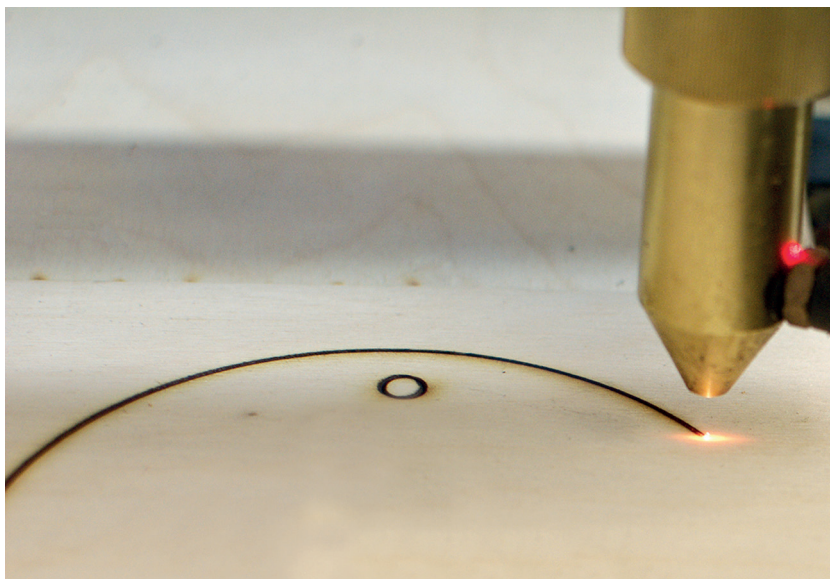
2

- (b) Describe how mass manufacturing technologies may impact the workforce.

2



9. Laser cutters are widely used in the manufacture of products.



Describe the benefits of using laser cutters to manufacture products.

4

10. Designers can use recycled materials to make products more sustainable.



Describe **four** other methods a designer could use to make products more sustainable.

4

[END OF QUESTION PAPER]



ADDITIONAL SPACE FOR ANSWERS



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

ADDITIONAL SPACE FOR ANSWERS



* X 8 1 9 7 5 0 1 2 6 *

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Question 5	Baby with Wooden House – Dmitry Galaganov/Shutterstock.com
Question 6	Hair Dryer – StockPhotosArt/Shutterstock.com
Question 7	Modern Rocking Horse – Valentina Zavrazhina/Shutterstock.com
Question 7	Traditional Rocking Horse – JasminkaM/Shutterstock.com
Question 7	Brass Stirrups – wideonet/Shutterstock.com
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