Cambridge Assessment International Education

Cambridge International AS & A Level

DESIGN & TECHNOLOGY **9705/11**

Paper 1 **October/November 2023**

3 hours

5128876679

You must answer on the answer booklet/paper.

You will need: Answer booklet/A4 paper
A3 drawing paper (2 sheets)
A range of design drawing equipment
Coloured pencils
Extra sheets of A3 drawing paper if needed

INSTRUCTIONS

- Answer **three** questions in total:
  - Section A: answer **one** question on the answer booklet/A4 paper provided.
  - Section B: answer **one** question on the answer booklet/A4 paper provided.
  - Section C: answer **one** question on A3 drawing paper. Use both sides of the paper.
- You may request additional sheets of A3 drawing paper, but only if you have used up both sides of each of the 2 sheets provided.
- If you have been given an answer booklet, follow the instructions on the front cover of the answer booklet.
- Use a black or dark blue pen.
- Write your name, centre number and candidate number on all the work you hand in.
- Do **not** use an erasable pen or correction fluid.
- You may use an HB pencil, or coloured pencils as appropriate, for any diagrams, graphs or rough working.
- At the end of the examination, fasten all your work together. Do **not** use staples, paper clips or glue.

INFORMATION

- The total mark for this paper is 120.
- The number of marks for each question or part question is shown in brackets [ ].
- All dimensions are in millimetres.

This document has **12** pages. Any blank pages are indicated.

Section A

Answer **one** question from this section on the Answer Booklet/A4 paper provided.

1 Fig. 1.1 gives details of a salt pot which is to be made in a school workshop.

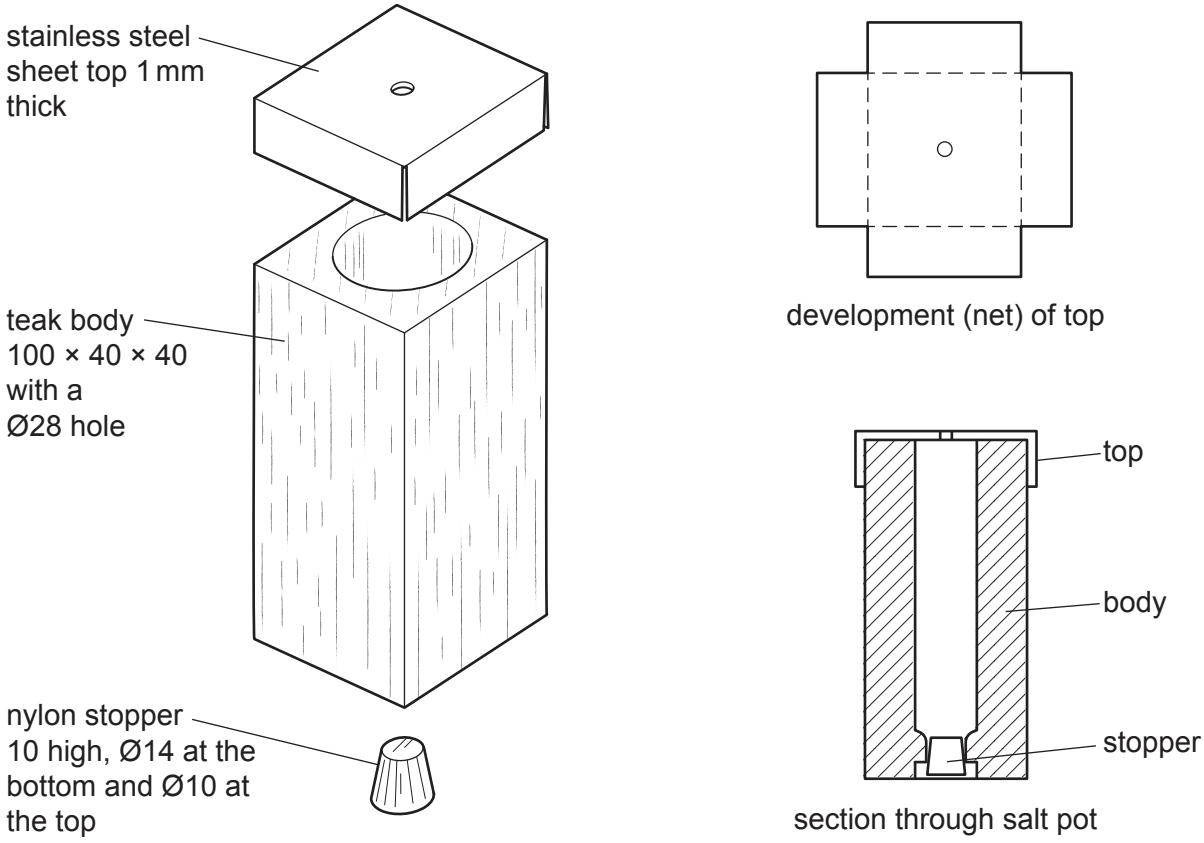

Fig. 1.1

(a) Give **two** reasons why stainless steel sheet is a suitable material for the top. [2]

(b) Use notes and sketches to describe:

(i) how the top could be made [6]

(ii) how the body could be made. [6]

You must give details about the tools, equipment and processes involved and the safety precautions that have to be undertaken at each stage.

(c) Use notes and sketches to show a method of producing a batch of 5000 nylon stoppers. [6]

2 Fig. 2.1 gives details of a calendar which is to be made in a school workshop.

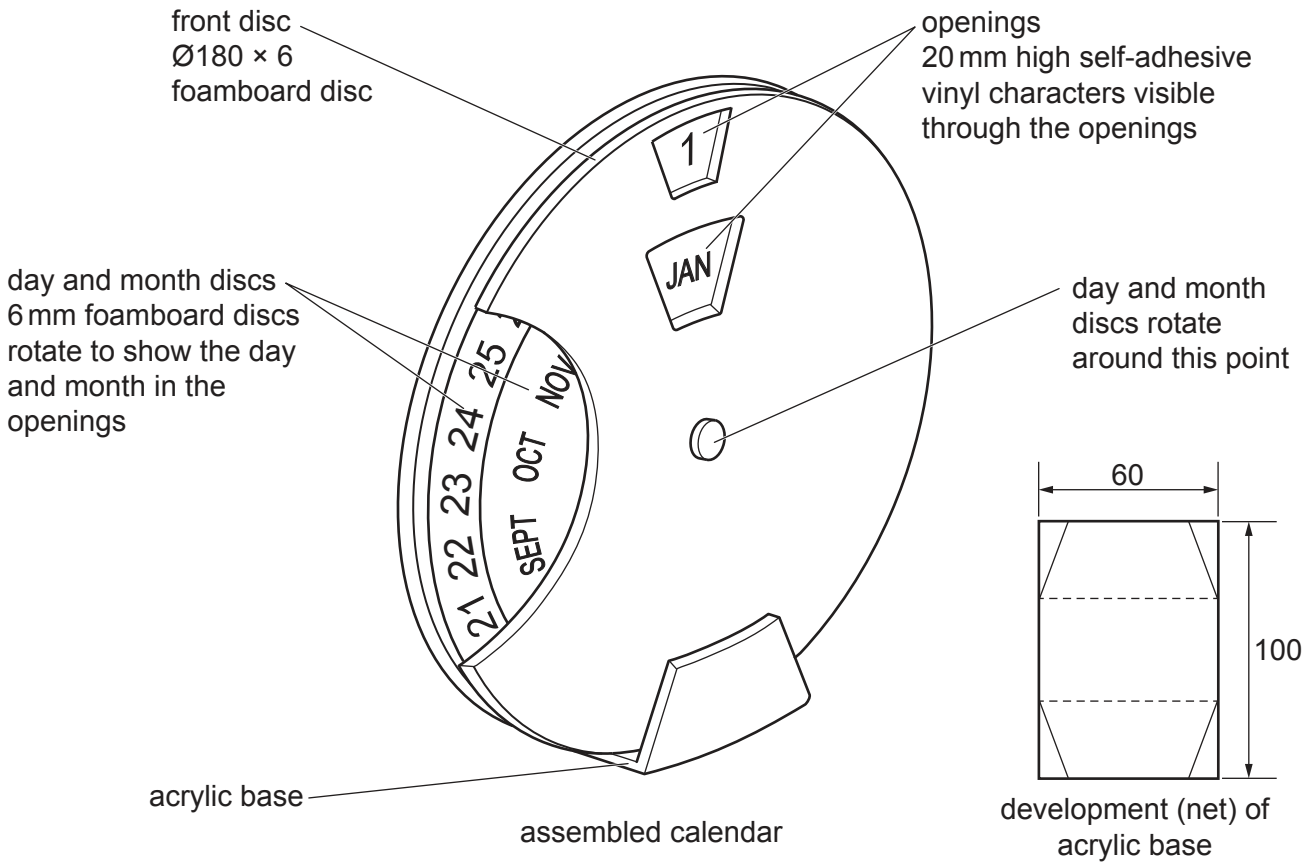

Fig. 2.1

(a) Use a sketch and notes to show how the foamboard discs could be secured at the centre point and be able to rotate. [2]

(b) Use notes and sketches to describe:

(i) how to make the front disc [6]

(ii) how to make and apply the self-adhesive vinyl characters [6]

(iii) how to make the acrylic base. [6]

You must give details about the tools, equipment and processes involved and the safety precautions that have to be undertaken at each stage.

3 Fig. 3.1 gives details of a toggle clamp which is to be made in a school workshop. The toggle clamp is made from 2 mm thick steel plate.

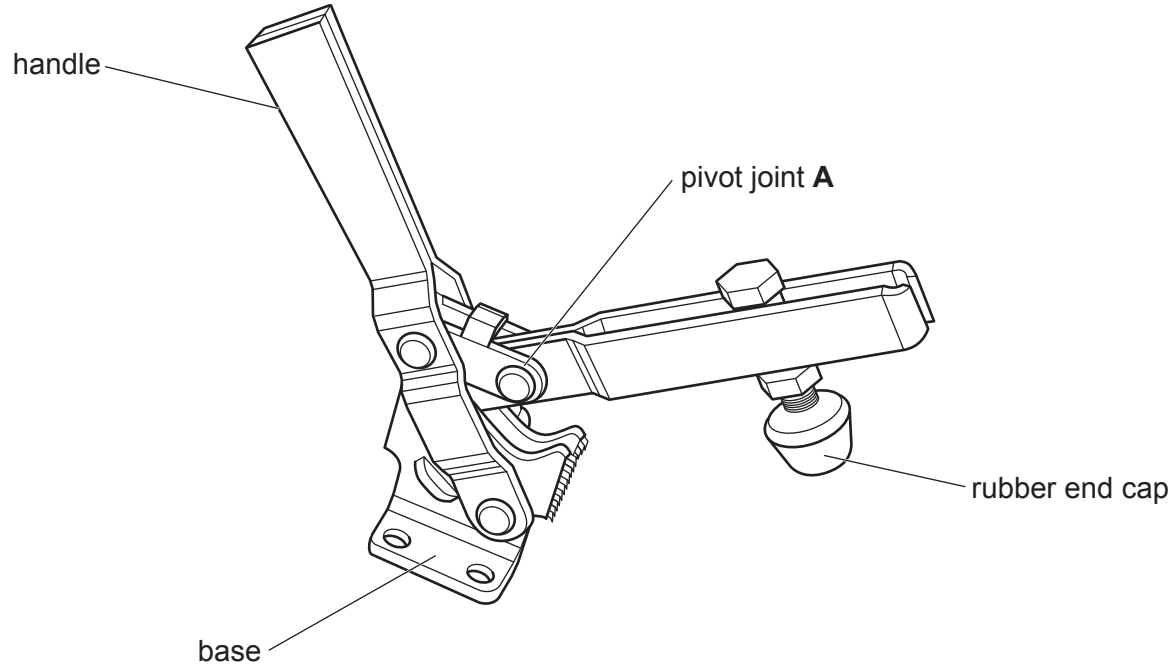

Fig. 3.1

(a) Explain why the toggle clamp has holes in the base. [2]

(b) Use notes and sketches to describe:

(i) how a plastic coating could be applied to the handle [6]

(ii) a method of making pivot joint **A**. [6]

You must give details about the tools, equipment and processes involved and the safety precautions that have to be undertaken at each stage.

(c) Use notes and sketches to describe how the toggle clamp is designed to be adjustable and to prevent damage to the material being clamped. [6]

Section B

Answer **one** question from this section on the Answer Booklet/A4 paper provided.

4 Fig. 4.1 shows an incomplete design for a folding table.

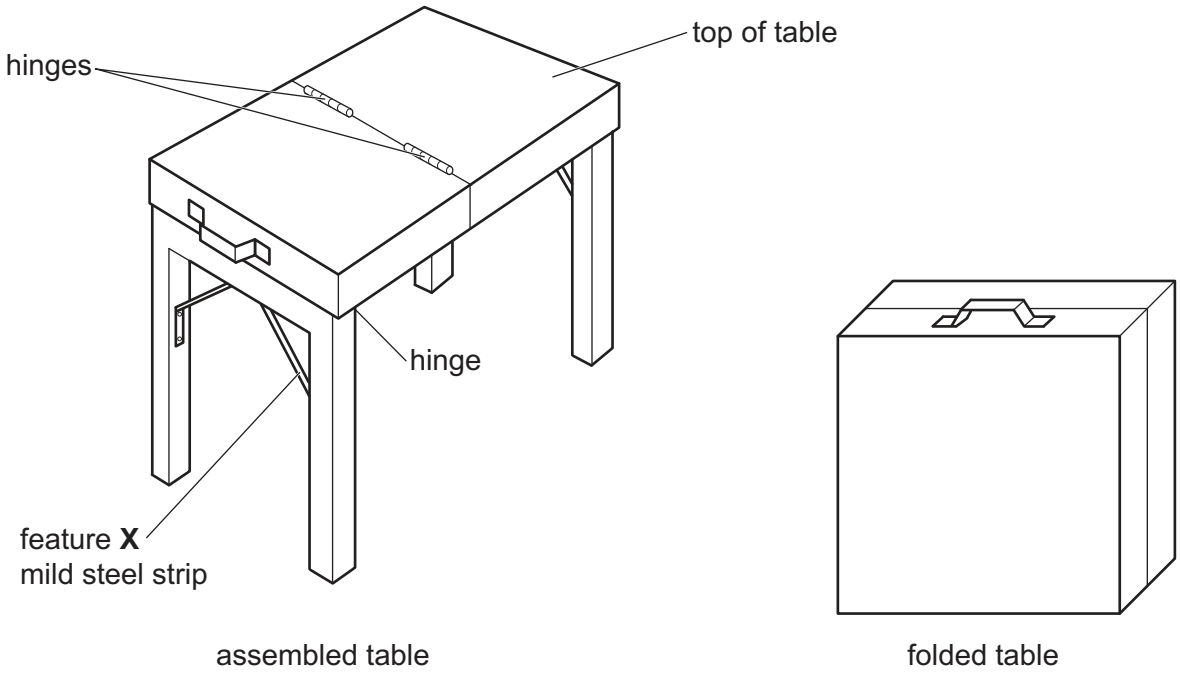

Fig. 4.1

(a) Explain the function of the design feature shown at **X**. [2]

(b) Identify and describe **two** problems with the folding table. [4]

(c) Use notes and sketches to explain how the design for the folding table would need to be changed to overcome the **two** problems you have identified in **part (b)**. [6]

(d) Discuss why manufacturers use standardised components, such as hinges, in products. Your answer should:

(i) analyse the given situation and identify **three** relevant issues raised by the question [3]

(ii) explain why you consider these issues to be relevant [3]

(iii) contain specific examples/evidence to support your conclusions. [2]

5 Fig. 5.1 shows an incomplete design for a package that is to be used to post samples of wooden flooring to customers.

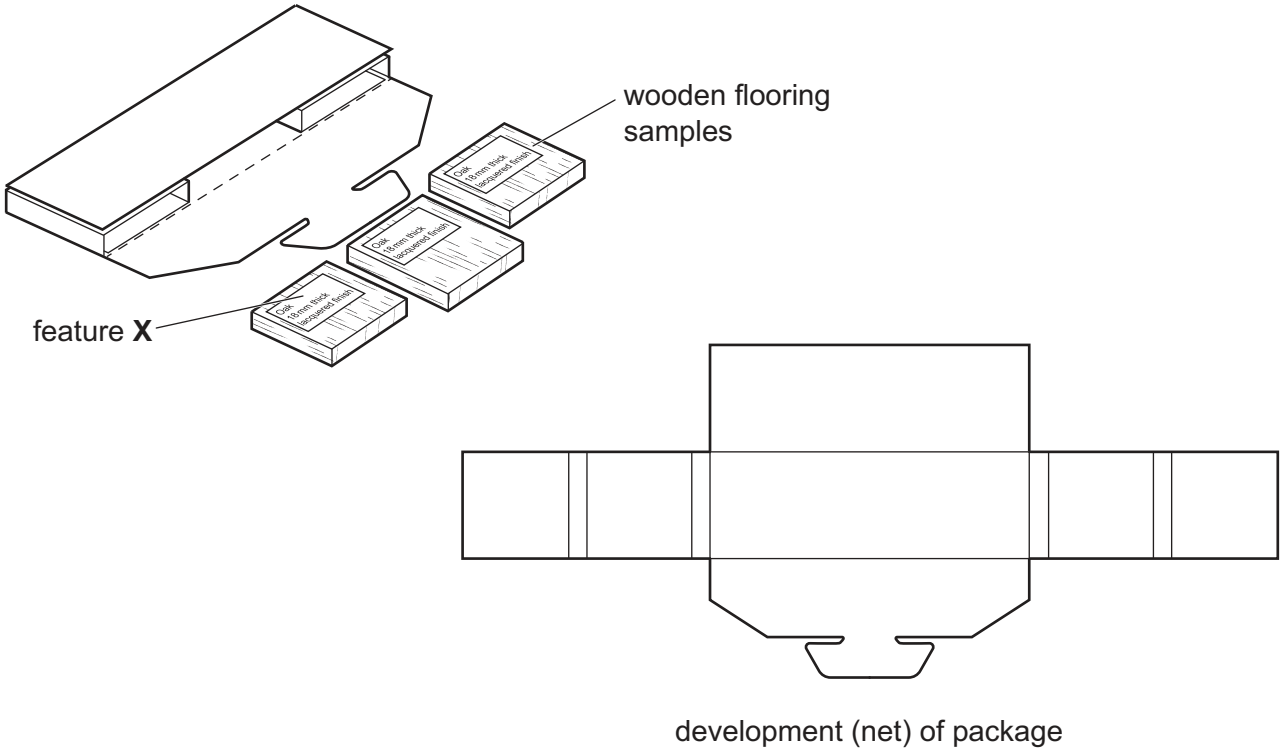

Fig. 5.1

(a) Explain the function of the design feature shown at **X**. [2]

(b) Identify and describe **two** problems that make the design for the package for the wooden flooring samples unsuitable for use. [4]

(c) Use notes and sketches to explain how the design for the package would need to be changed to overcome the **two** problems you have identified in **part (b)**. [6]

(d) Discuss why designers of packaging use CAD (computer aided design) to develop and communicate design proposals. Your answer should:

(i) analyse the given situation and identify **three** relevant issues raised by the question [3]

(ii) explain why you consider these issues to be relevant [3]

(iii) contain specific examples/evidence to support your conclusions. [2]

6 Fig. 6.1 shows an incomplete design for a hospitality tray that is used in a hotel room.

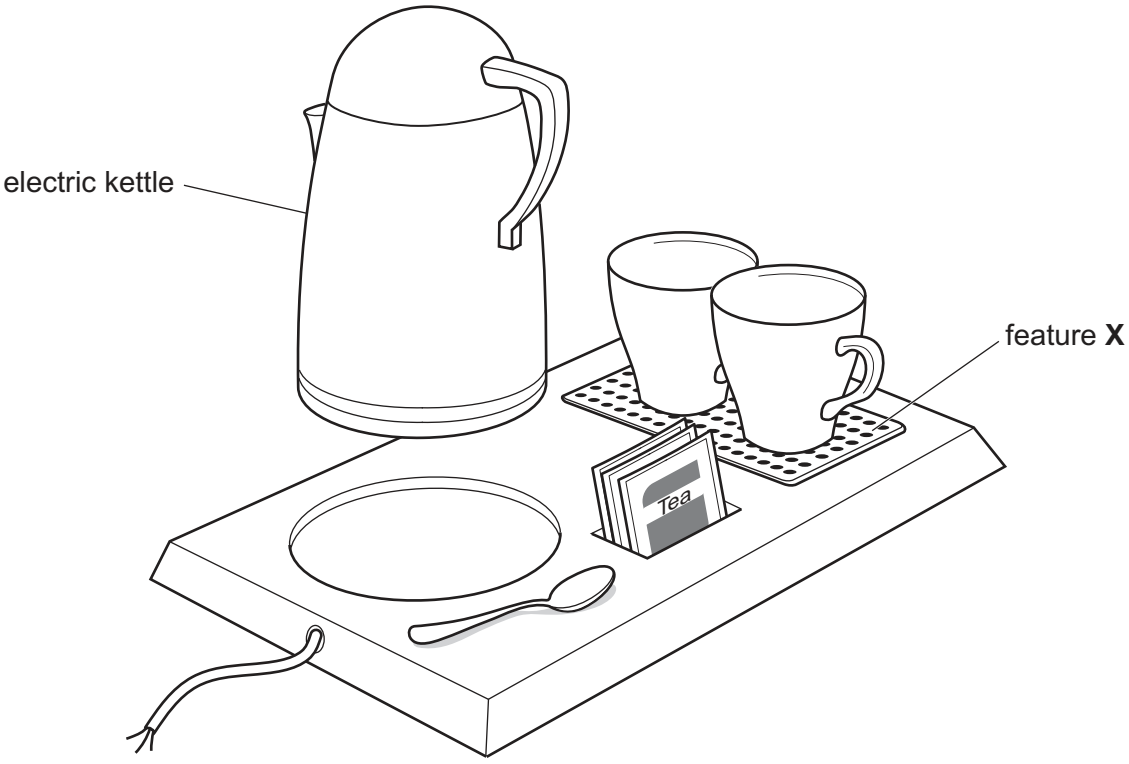

Fig. 6.1

(a) Explain the function of the design feature shown at **X**. [2]

(b) Identify and describe **two** problems with the design of the hospitality tray. [4]

(c) Use notes and sketches to explain how the design of the hospitality tray would need to be changed to overcome the **two** problems you have identified in **part (b)**. [6]

(d) Discuss how designers of products, such as the hospitality tray, consider ergonomics during the design process. Your answer should:

(i) analyse the given situation and identify **three** relevant issues raised by the question [3]

(ii) explain why you consider these issues to be relevant [3]

(iii) contain specific examples/evidence to support your conclusions. [2]

Section C

Answer **one** question from this section on the plain A3 paper provided.

You are provided with two sheets of plain A3 paper. You should use **both** sides of the paper. **Each** of the four parts **(a) – (d)** of the question you choose to answer should take up one side of paper.

When you are asked to **develop** a design you must show, using notes and sketches, the development and evaluation of a **range** of ideas into a single design solution. The design proposal should be annotated to give details about materials, joining methods and important sizes.

7 Fig. 7.1 shows an incomplete design for a trolley that is to be used to move potted plants around a garden centre.

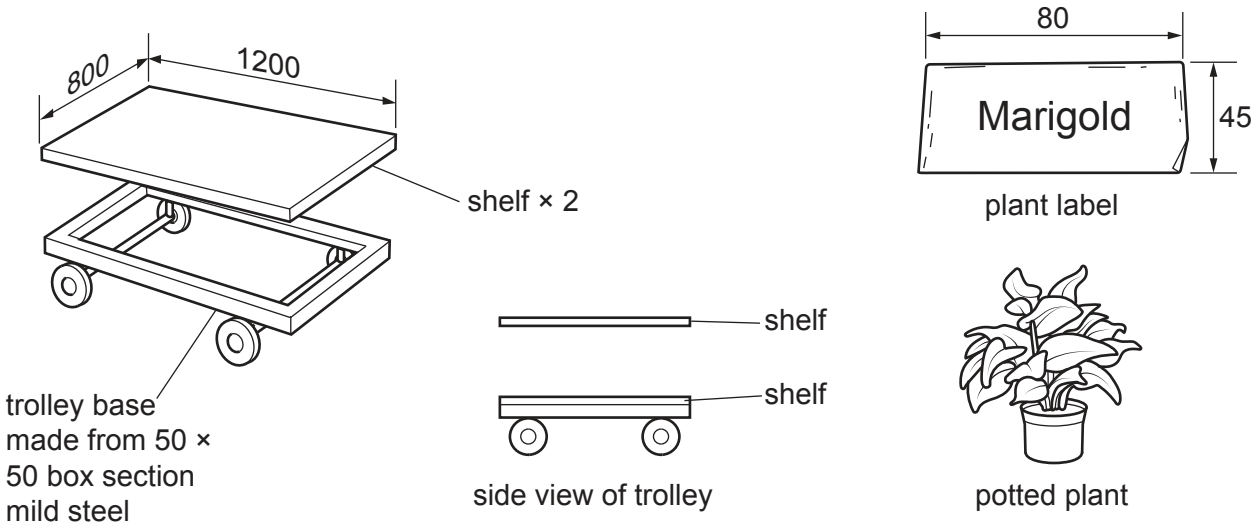

Fig. 7.1

(a) Use notes and sketches to **develop** a design for the shelf to prevent the potted plants from sliding off and allow excess water to be collected and reused. [20]

(b) Use notes and sketches to **develop** a design for a frame that attaches to the trolley base and supports two of the shelves designed in **part (a)**. The upper shelf must be adjustable to accommodate taller plants. [20]

(c) Use notes and sketches to **develop** a design for a holder for the plant label that attaches to the shelf designed in **part (a)**. The holder must allow the label to be easily changed and protect it from moisture. [20]

(d) Produce a pictorial (3D) rendered drawing of the complete trolley which shows all of the features that you have designed in **parts (a) – (c)**. [20]

8 Fig. 8.1 shows the parts of an outdoor game called **Additions**. The game involves children throwing hoops onto numbered foam tiles to achieve the highest score.
The game consists of 20 foam tiles that join together, to make a play mat, and 4 hoops.

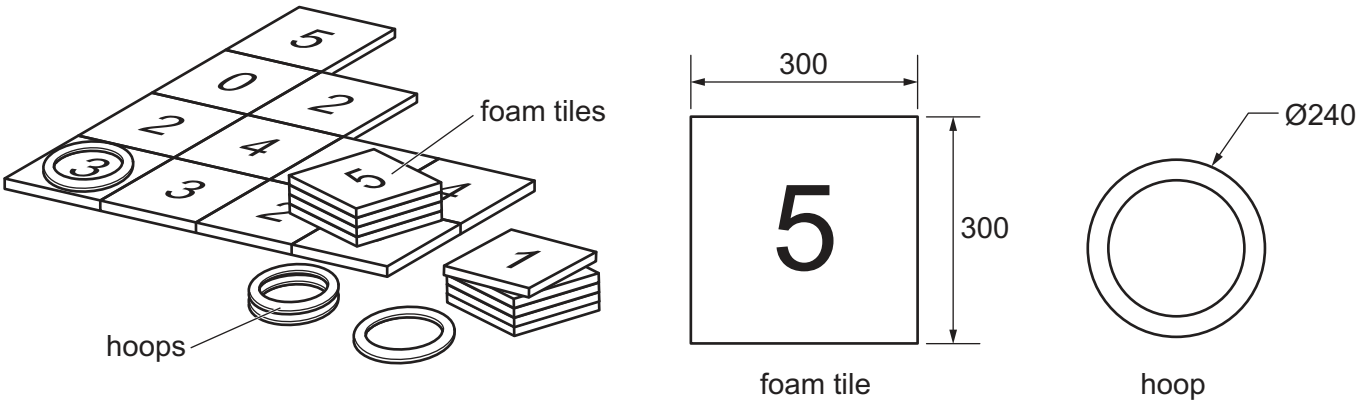

Fig. 8.1

(a) Use notes and sketches to **develop** a design for an instruction sheet that shows how to play the game. The instructions must use pictures and **not** words. [20]

(b) Use notes and sketches to **develop** a method of joining the foam tiles together to make a play mat. [20]

(c) Use notes and sketches to **develop** a design for a carrying case to hold the parts of the outdoor game and the instruction sheet designed in **part (a)**. The instruction sheet must be visible when the case is closed. [20]

(d) Produce a pictorial (3D) rendered drawing of the outdoor game which shows all of the features that you have designed in **parts (a) – (c)**. [20]

9 Fig. 9.1 shows details of a scaffold, a metal tube and a bucket.

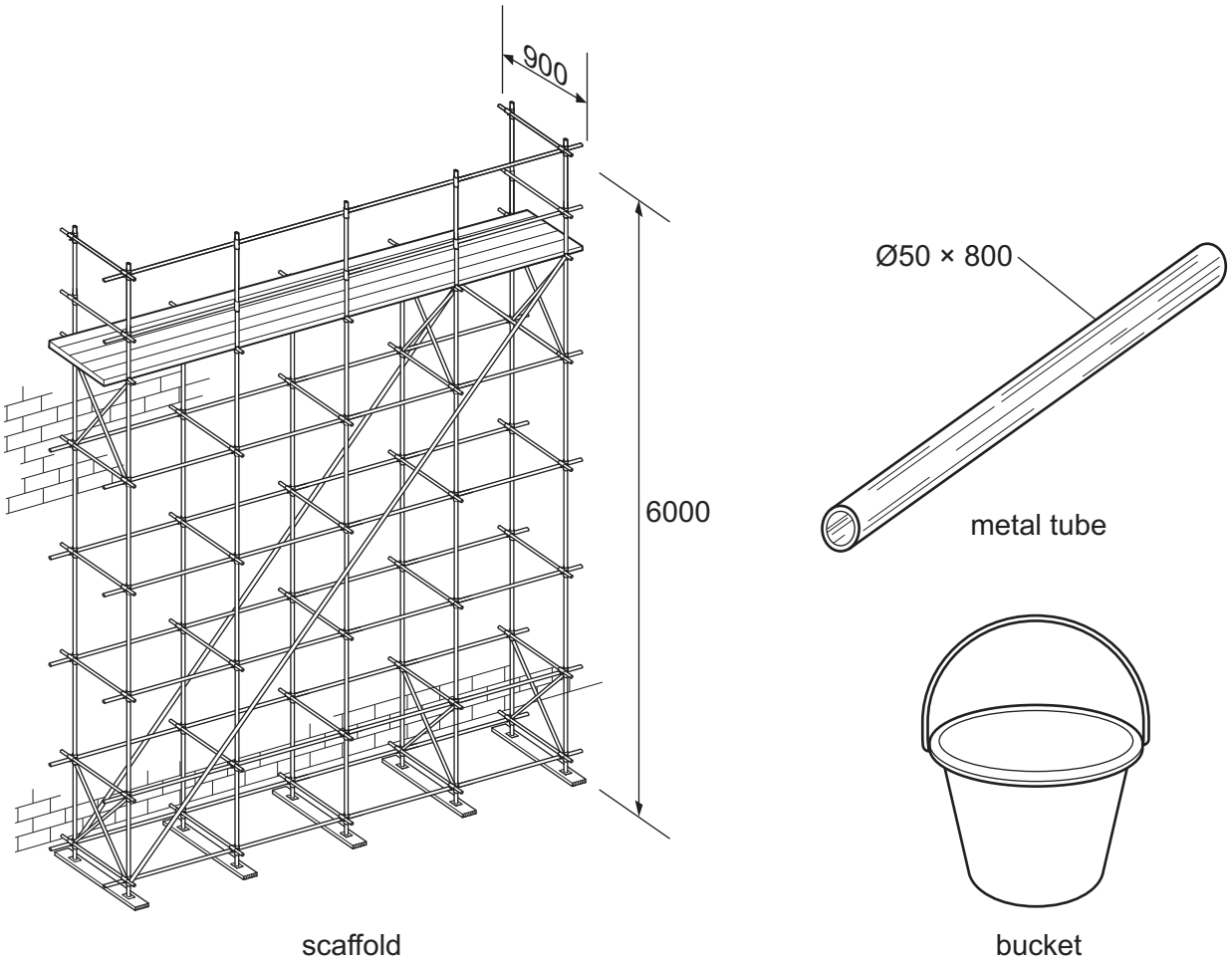

Fig. 9.1

(a) Use notes and sketches to **develop** a design for a device that will securely, but temporarily, attach the metal tube horizontally at 90° to the scaffold handrail. [20]

(b) Use notes and sketches to **develop** a design for a device that will raise and lower the bucket. The device must attach to the metal tube and be operated from the top of the scaffold. [20]

(c) Use notes and sketches to **develop** a design for a device that will give a visual and audible warning when the bucket is being raised or lowered. [20]

(d) Produce a pictorial (3D) rendered drawing of the complete lifting device which shows all of the features that you have designed in **parts (a) – (c)**. [20]

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