

Cambridge International AS & A Level

DESIGN & TECHNOLOGY

9705/11

Paper 1

October/November 2024

3 hours

A standard 1D barcode is positioned vertically on the left side of the page. The barcode represents the number 8484965152, which is also printed in a large, bold, black font directly below the barcode.

You must answer on the answer booklet/paper.

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

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.

Section A

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

1 Fig. 1.1 gives details of a test tube rack.

Part A

15 mm thick hardwood shelf with $6 \times \varnothing 30$ holes

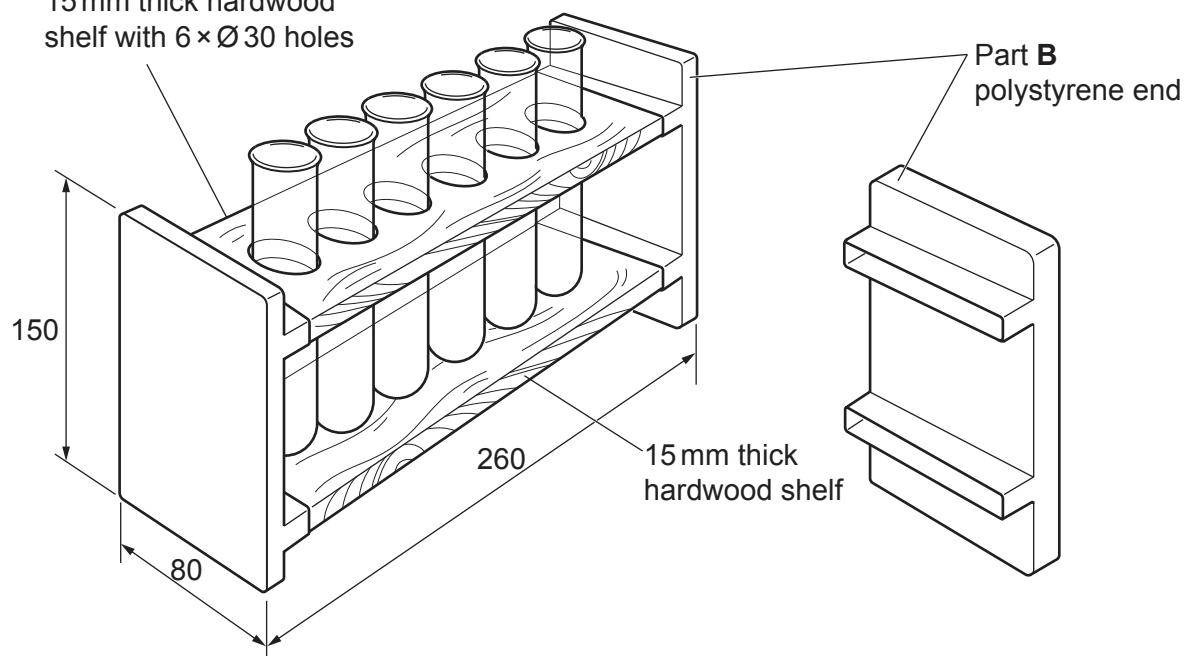


Fig. 1.1

(a) Name a specific hardwood that could be used for Part A and give a reason for your choice. [2]

(b) Use notes and sketches to describe:

(i) how to mark out and drill the holes in Part A [6]

(ii) how to make a batch of 5000 of Part B. [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) The test tube rack is assembled by pushing the shelves into the ends. Use notes and sketches to describe a method of temporarily securing the shelves to the ends. [6]

2 Fig. 2.1 gives details of a package, for a light bulb, which is to be made in a school workshop.

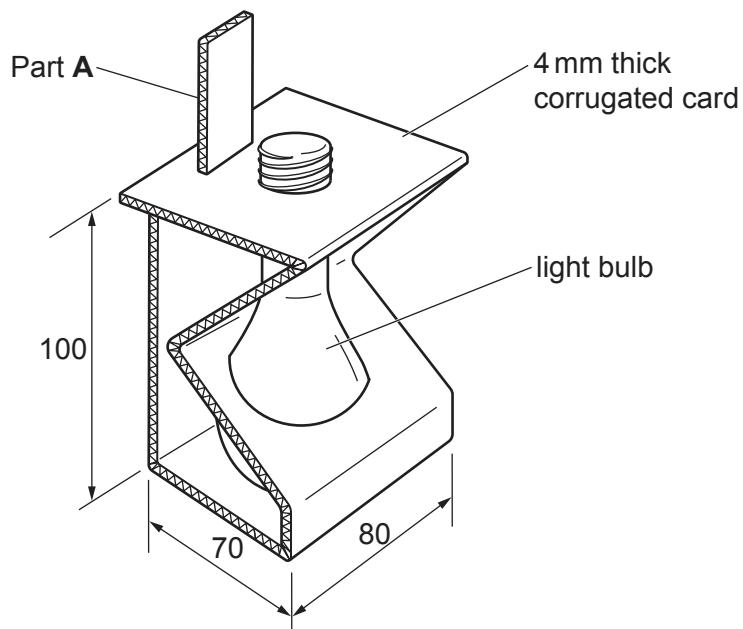


Fig. 2.1

- (a) Give **two** reasons why corrugated card is a suitable material for the package. [2]
- (b) Use notes and sketches to show the shape of the one-piece development (net) required to make the package. [6]
- (c) Use notes and sketches to show how the development (net) could be marked out and cut from a sheet of 4 mm thick corrugated card. [6]

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

- (d) Use notes and sketches to show how Part A could be modified to hold the package together and provide a means of hanging the package on a display rack. No additional materials are to be used. [6]

3 Fig. 3.1 gives details of a clamp which is to be made in a school workshop.

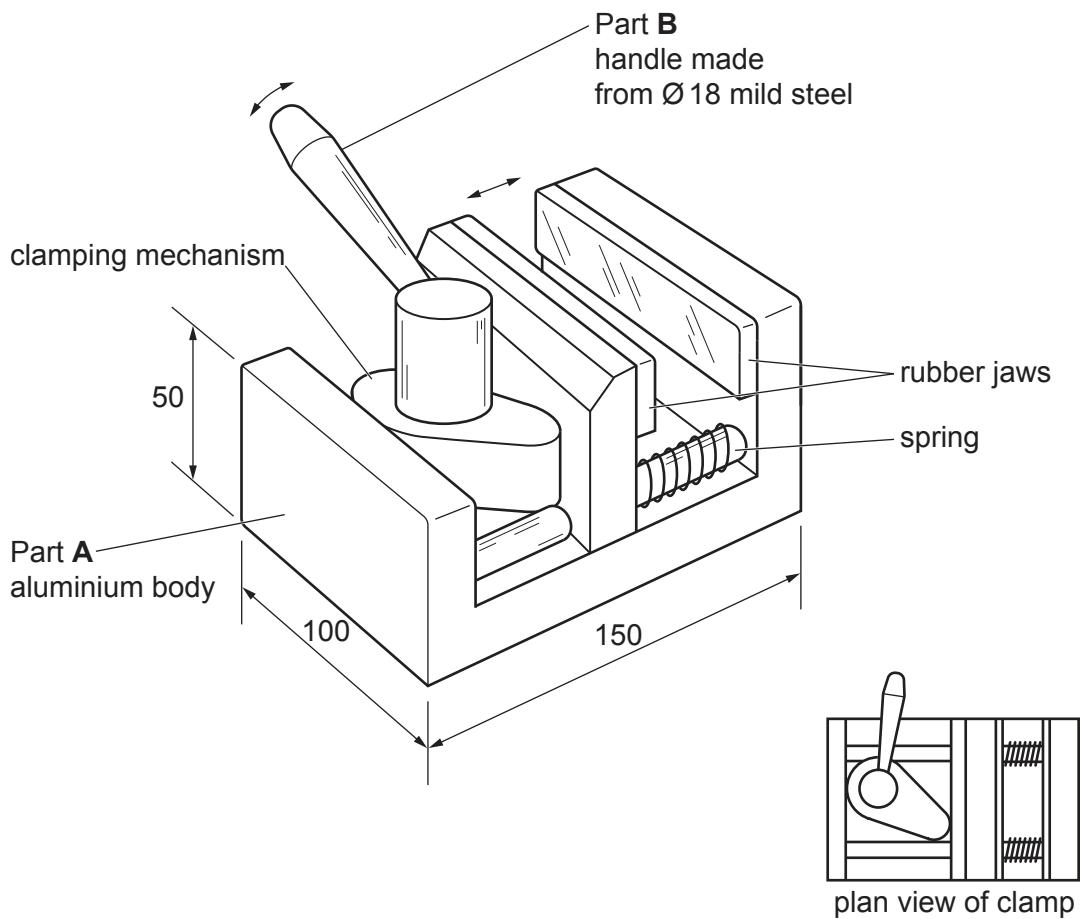


Fig. 3.1

(a) Explain **one** reason why the clamp has rubber jaws. [2]

(b) Use notes and sketches to describe:

- (i) a method of making Part A, the aluminium body [6]
- (ii) a method of making Part B, the handle. [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 clamping mechanism works. [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 bathroom cabinet.

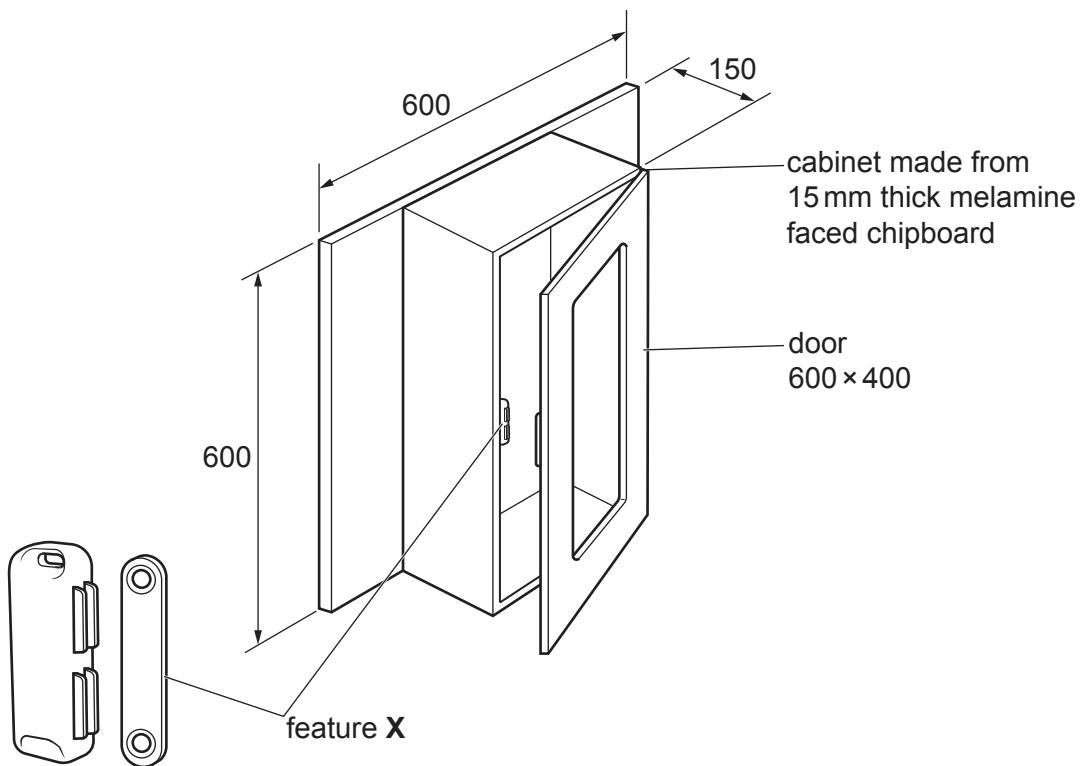


Fig. 4.1

- (a) Explain the function of the design feature shown at X. [2]
- (b) Identify and describe **two** problems with the bathroom cabinet. [4]
- (c) Use notes and sketches to explain how the design for the bathroom cabinet would need to be changed to overcome the **two** problems you have identified in part (b). [6]
- (d) Discuss why manufacturers of furniture, such as the bathroom cabinet, produce products that are fully assembled with permanent fixings. 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 for chocolates.

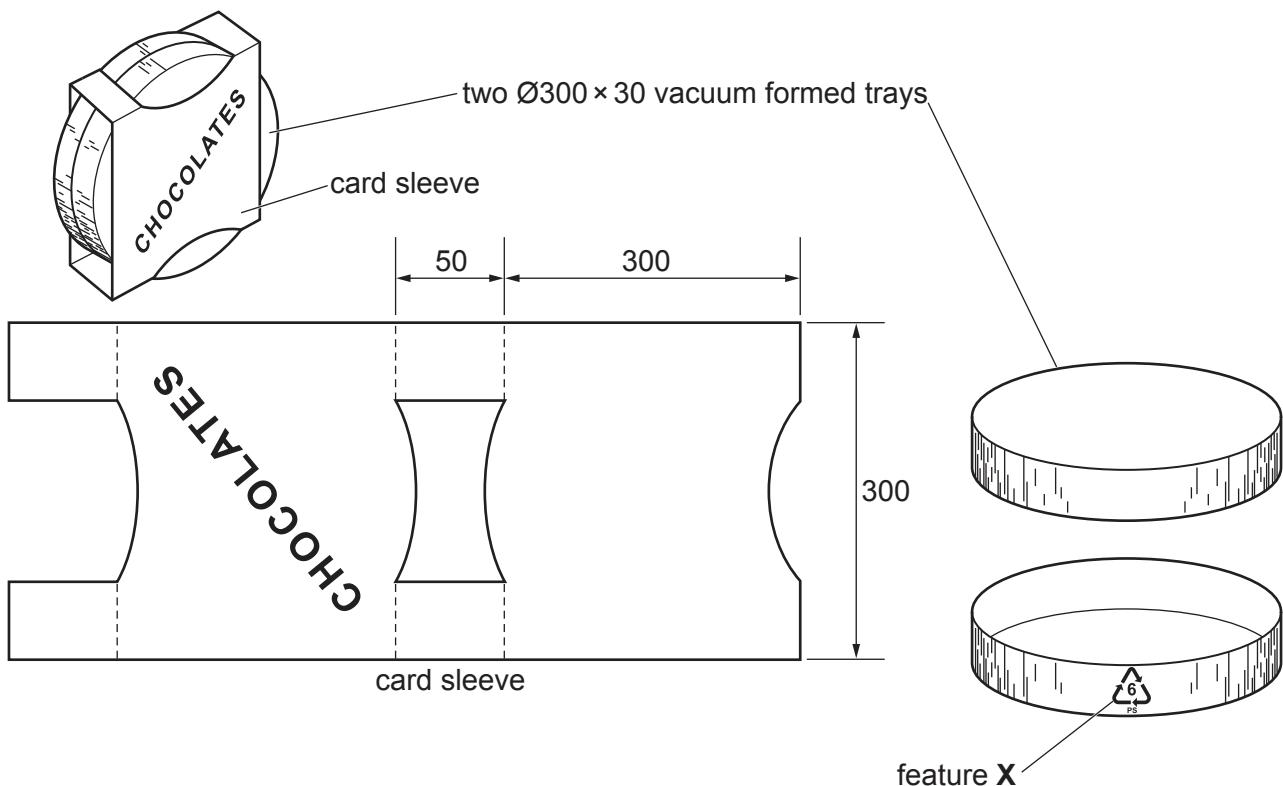


Fig. 5.1

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

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

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

(d) Discuss why designers of packages should consider environmental issues. Your answer should:

- analyse the given situation and identify **three** relevant issues raised by the question [3]
- explain why you consider these issues to be relevant [3]
- contain specific examples/evidence to support your conclusions. [2]

6 Fig. 6.1 shows an incomplete design for a battery-operated alarm clock.

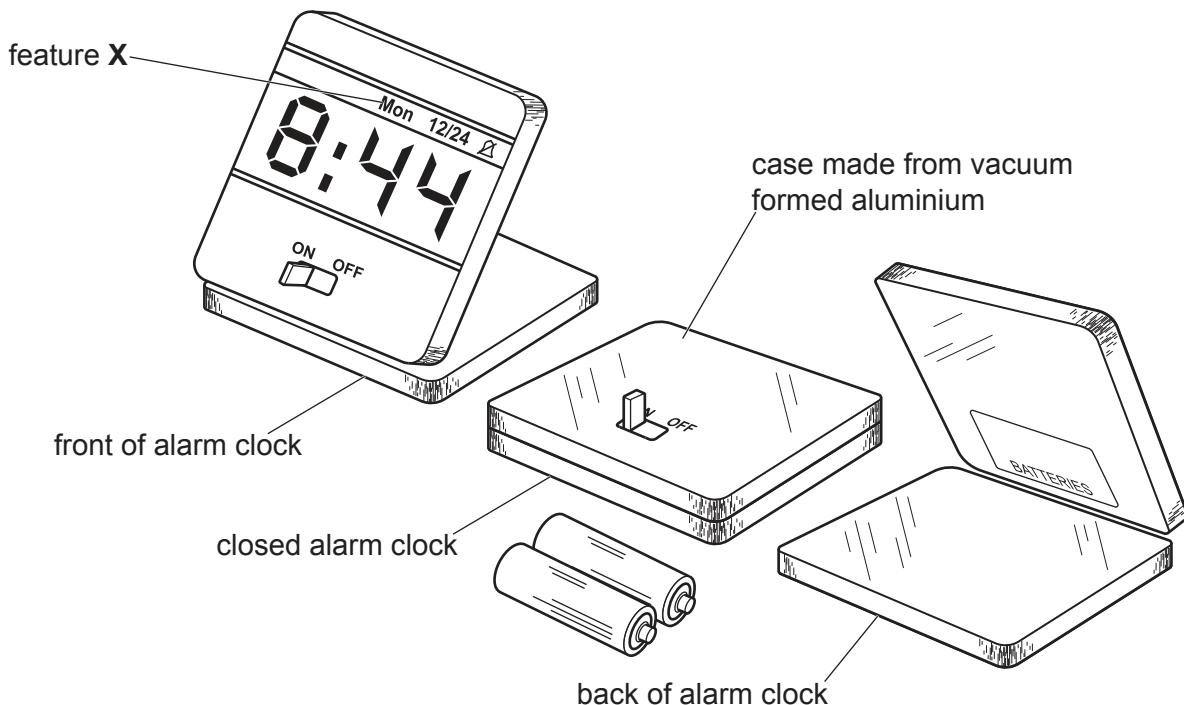


Fig. 6.1

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

(b) Identify and describe **two** problems with the battery-operated alarm clock. [4]

(c) Use notes and sketches to explain how the battery-operated alarm clock would need to be changed to overcome the **two** problems you have identified in part (b). [6]

(d) Discuss how the colour of products influences customers. Your answer should:

- analyse the given situation and identify **three** relevant issues raised by the question [3]
- explain why you consider these issues to be relevant [3]
- 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 details of a tray for serving sandwiches, and a card label.

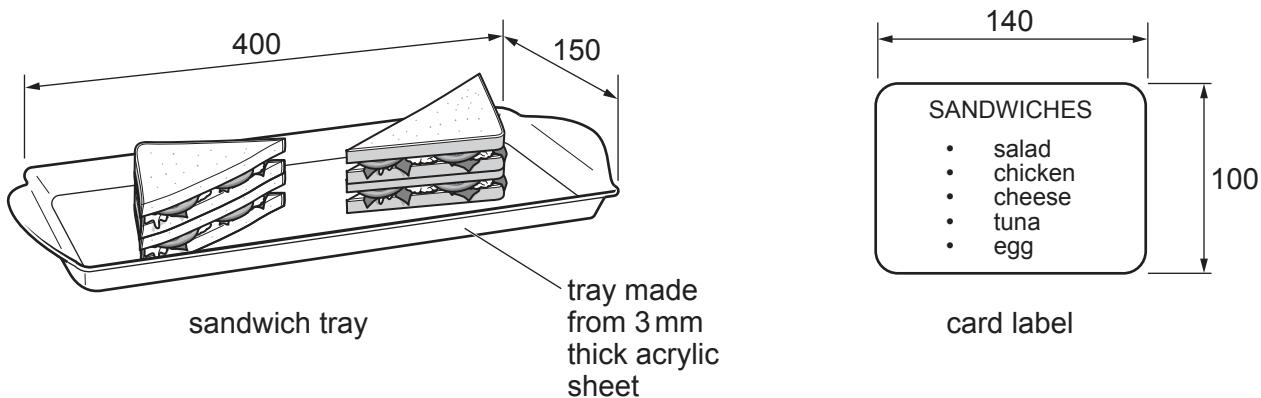


Fig. 7.1

- (a) Use notes and sketches to **develop** a design for a frame that supports **two** sandwich trays of the type shown in Fig. 7.1. It must be possible to easily remove the trays for cleaning. [20]
- (b) Use notes and sketches to **develop** a design for a base that attaches to the frame designed in **part (a)** and allows the frame to rotate. [20]
- (c) Use notes and sketches to **develop** a design for a handle or handles that can be attached to the frame designed in **part (a)**. The handle or handles must include a holder for the card label which shows the different types of sandwich. [20]
- (d) Produce a pictorial (3D) rendered drawing of the complete stand for sandwiches which shows all of the features that you have designed in **parts (a) – (c)**. [20]

8 Fig. 8.1 shows details of a freestanding sign that is to be made from Corriflute. The sign will be used outside a shop to advertise special offers.

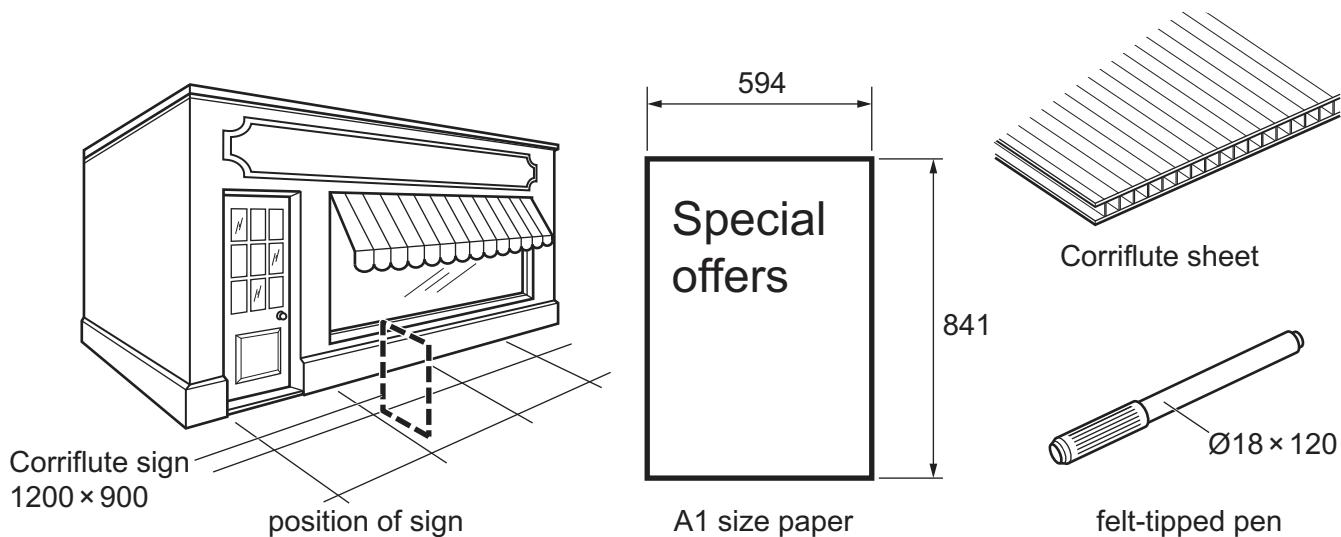


Fig. 8.1

- (a) Use notes and sketches to **develop** a design for a freestanding Corriflute sign of the size shown in Fig. 8.1. The sign must be formed from a one-piece development (net). [20]
- (b) Use notes and sketches to **develop** a design for a method to prevent the freestanding Corriflute sign designed in part (a) from blowing away in the wind. The method must **not** attach to the pavement or front of the shop. [20]
- (c) Use notes and sketches to **develop** a design for a method of attaching an A1 size sheet of paper onto the freestanding Corriflute sign designed in part (a). The method of attachment must also include a means of holding the felt-tipped pen shown in Fig. 8.1. [20]
- (d) Produce a pictorial (3D) rendered drawing of the freestanding Corriflute sign which shows all of the features that you have designed in parts (a) – (c). [20]

9 Fig. 9.1 shows an incomplete design for a child's game. The gantry moves along the top of the tray and then lowers the magnet to pick up the metal discs.

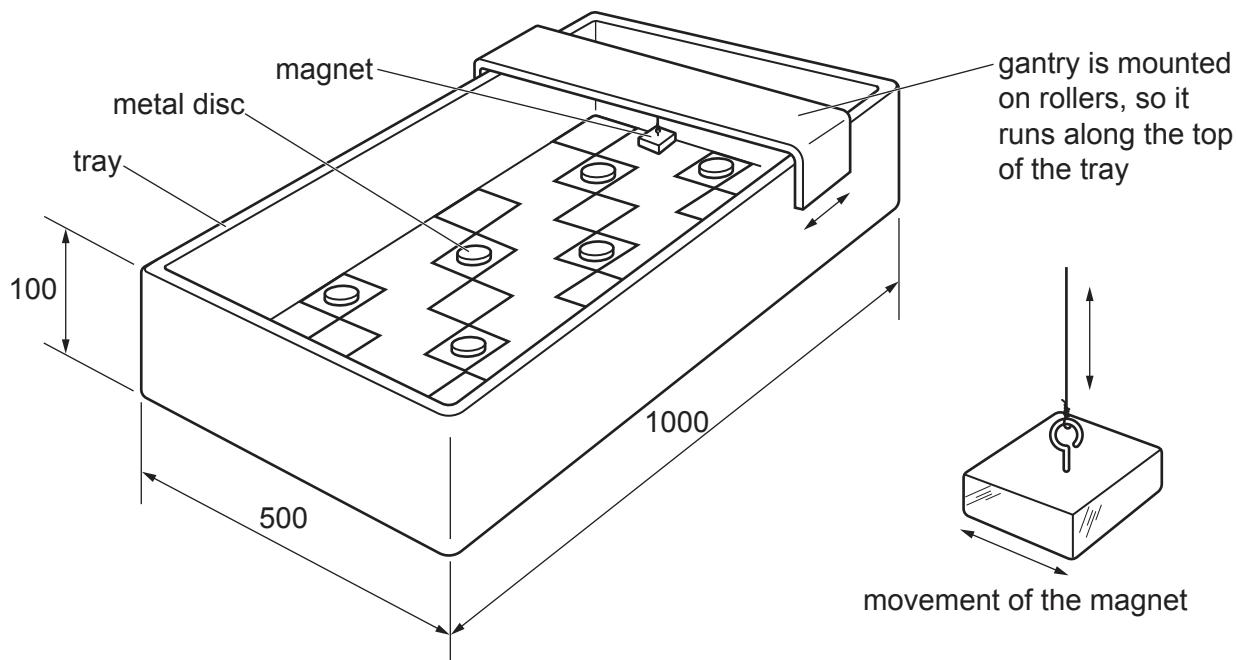


Fig. 9.1

- (a) Use notes and sketches to **develop** a design for a mechanism that will move the magnet backwards and forwards along the gantry. The magnet must stop at any position along the gantry. [20]
- (b) Use notes and sketches to **develop** a design for another mechanism, different to that designed in **part (a)**, that will lower and raise the magnet by 80 mm so that it can pick up a metal disc. [20]
- (c) Use notes and sketches to **develop** a design for a device that will give a visual indication when the magnet attaches to a metal disc. [20]
- (d) Produce a pictorial (3D) rendered drawing which shows all of the features that you have designed in **parts (a) – (c)**. [20]

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