



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education
Advanced Subsidiary Level and Advanced Level

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DESIGN AND TECHNOLOGY

9705/12

Paper 1

October/November 2010

3 hours

Additional Materials: Answer Booklet/A4 Paper
A3 Drawing Paper (3 sheets)
Extra sheets of A3 drawing paper for candidates who have used up both sides of their 3 sheets
A range of design drawing equipment

* 2 6 0 5 8 6 7 8 3 0 *

READ THESE INSTRUCTIONS FIRST

If you have been given an Answer Booklet, follow the instructions on the front cover of the Booklet. Write your name, Centre number and candidate number on all the work you hand in. Write in dark blue or black pen. You may use a soft pencil, or coloured pencils/pens as appropriate, for any diagrams, graphs or rough working. Do not use staples, paper clips, highlighters, glue or correction fluid.

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 plain A3 paper. Use **both** sides of the paper. You may request additional sheets of A3 paper, but only if you have used up both sides of each of the 3 sheets provided.

You are advised to spend **30 minutes** on each of Sections A and B and **2 hours** on Section C.

At the end of the examination, fasten all your work securely together. The number of marks is given in brackets [] at the end of each question or part question. All dimensions are in millimetres.

This document consists of **10** printed pages and **2** blank pages.

Section A

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

- 1 Fig. 1 shows a small shovel which is to be made in a school workshop. The shovel will be used to move hot charcoal on a barbecue.

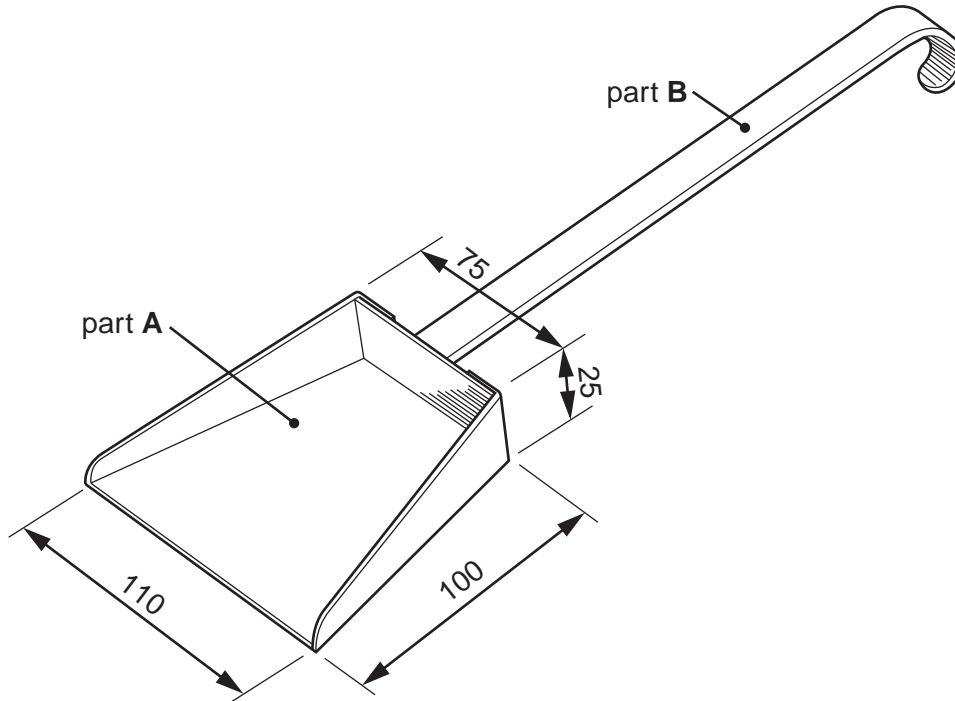


Fig. 1

- (a) Name a suitable sheet material for making part **A** of the design and give **one** reason for your choice. [2]
- (b) Use notes and sketches to describe:
- (i) how a template could be made and used to help mark out the shape required to make part **A**; [6]
 - (ii) how part **A** could be cut out, the edges smoothed and then bent to the required shape; [6]
 - (iii) how part **A** could be joined to 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.

2 Fig. 2 shows a photograph stand which is to be made in a school workshop.

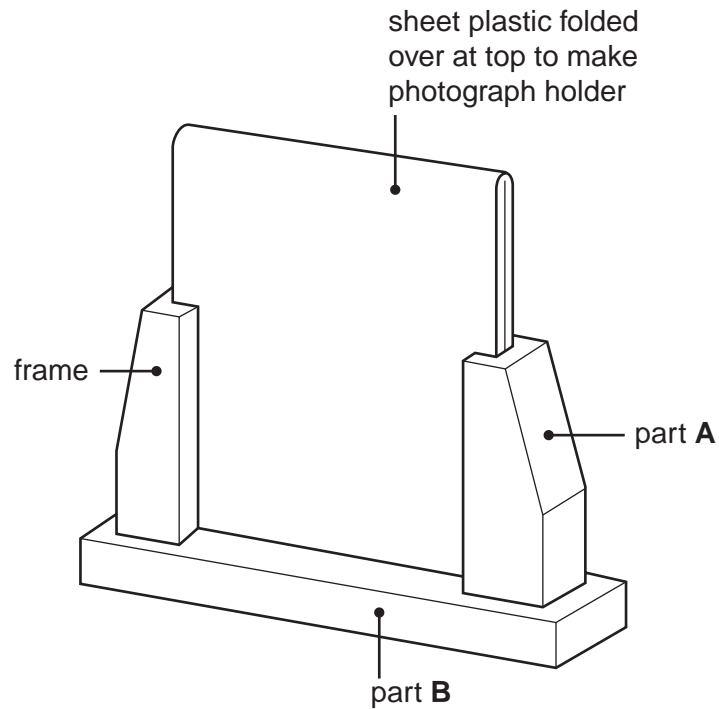


Fig. 2

(a) Name a suitable:

- (i) sheet plastic for making the photograph holder; [1]
- (ii) softwood for making the frame. [1]

(b) Use notes and sketches to describe:

- (i) how a jig could be made and used to help bend the sheet plastic; [6]
- (ii) how the grooves which the photograph holder slides in could be made; [6]
- (iii) how parts **A** and **B** could be joined together. [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 shows a folder which is to be made in a school workshop.

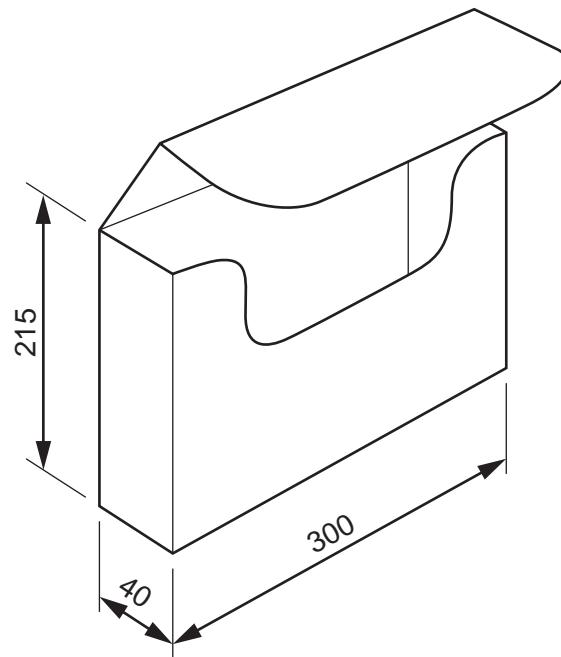


Fig. 3

- (a) The folder will be made from one piece of card with the front corners glued together.

Sketch to an appropriate scale, the development (net) required to make the folder. [6]

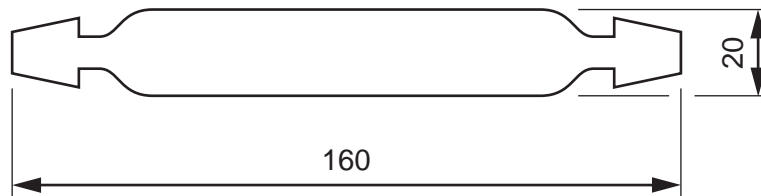


Fig. 4

- (b) Fig. 4 shows the handle that will be attached to the top of the folder. The handle will be made from 1 mm thick sheet plastic.

Name a suitable sheet plastic for making the handle and give **one** reason for your choice. [2]

- (c) Use notes and sketches to describe:

- (i) how the handle could be cut out; [3]
- (ii) a method of attaching the handle to the folder that allows it to lie flat when not in use; [3]
- (iii) a method that keeps the folder securely closed when it is being carried. [6]

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

Section B

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

- 4 Fig. 5 shows a design for a large container which is to be located in a shop, for collecting unwanted plastic carrier bags.

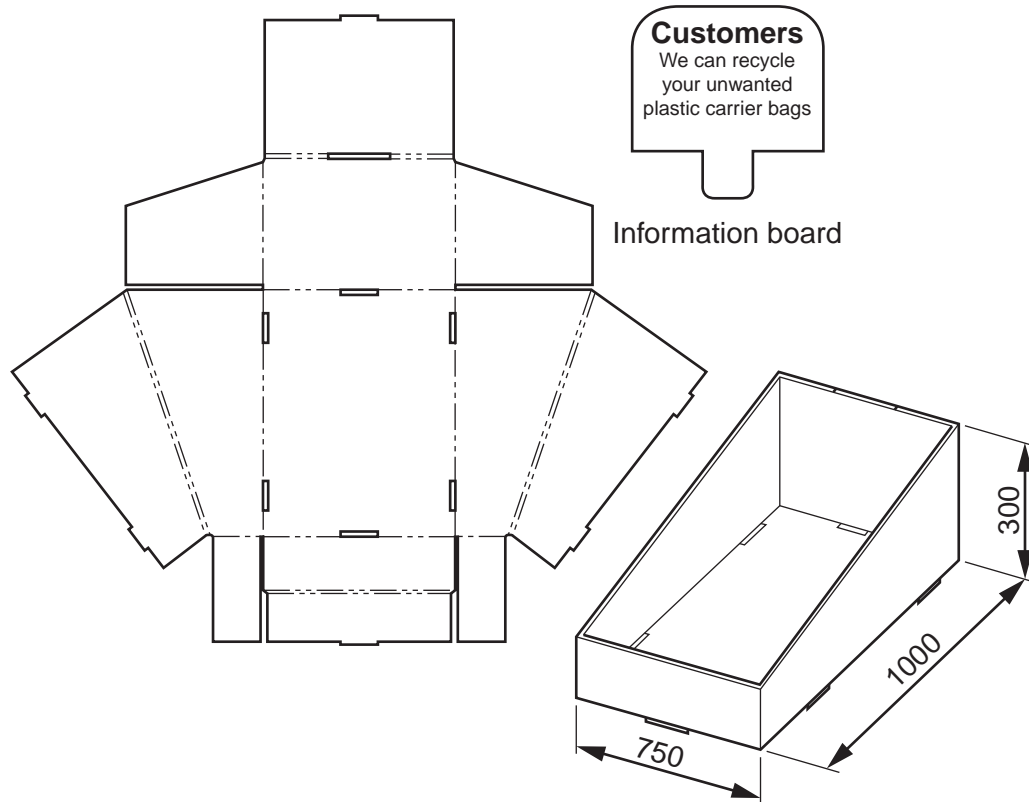


Fig. 5

- (a) Using notes and a sketch, explain how the information board is attached to the container. [2]
- (b) Describe **two** problems with the design of the container. [4]
- (c) Using notes and sketches, explain how the design would need to be changed to overcome the two problems that you have identified in (b). [6]
- (d) Discuss how and why manufacturers and retailers are reducing the amount of packaging they use. Your answer should:
- analyse the given situation and identify three relevant issues raised by the question; [3]
 - explain why you consider these three issues to be relevant; [3]
 - contain specific examples/evidence as support for your conclusions. [2]

- 5 Fig. 6 shows a design for a tray to be used to carry cups, saucers and plates. The tray is to be made from sheet plastic with the aid of a male and a female former.

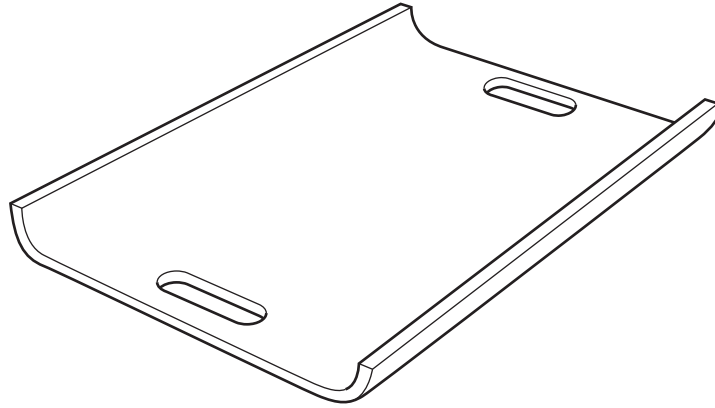


Fig. 6

- (a) Using notes and a sketch, describe what the male and female formers would look like. [2]
- (b) Explain **two** problems with the design of the tray. [4]
- (c) Using notes and sketches, explain how the design would need to be changed to overcome the two problems that you have identified in (b). [6]
- (d) Discuss the merits of using formers and jigs when batch producing 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 three issues to be relevant; [3]
 - (iii) contain specific examples/evidence as support for your conclusions. [2]

6 Fig. 7 shows a range of step ladder designs.

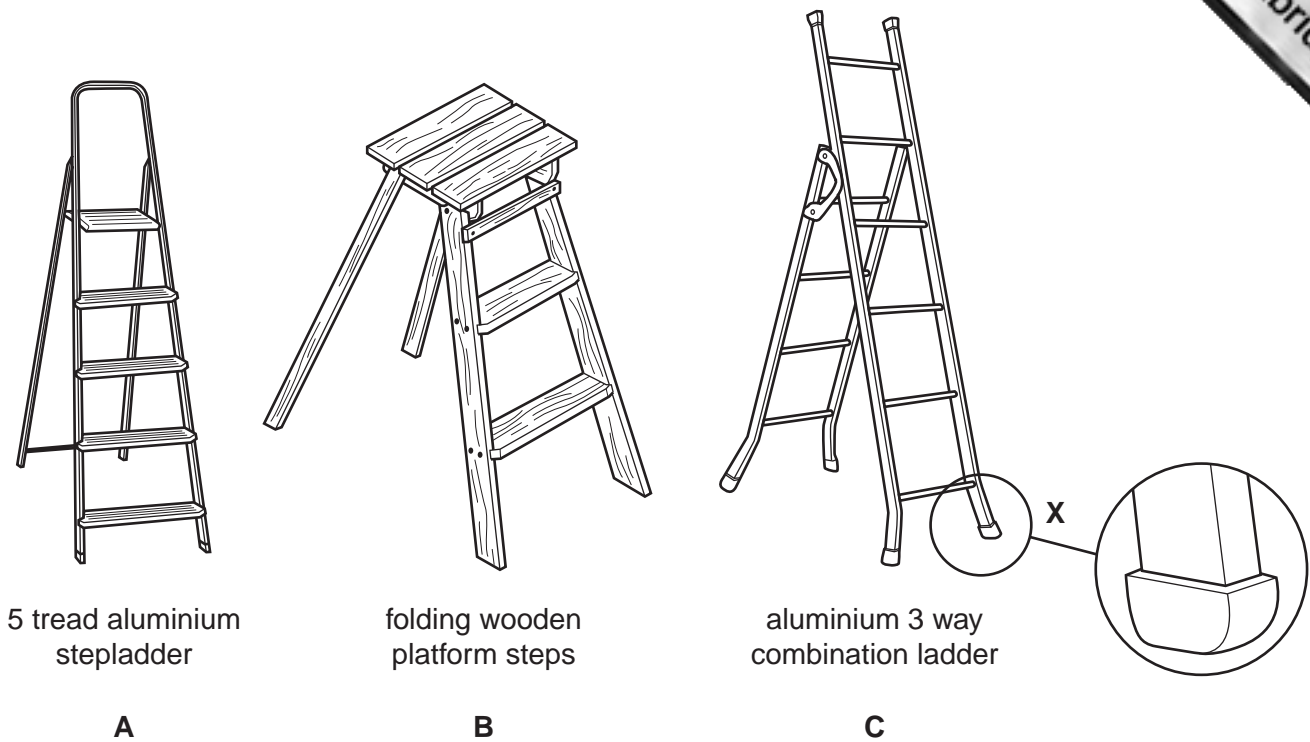


Fig. 7

- (a) Explain the function of the design feature shown at X. [2]
- (b) Describe **two** problems with design B. [4]
- (c) Using notes and sketches, explain how the design would need to be changed to overcome the two problems that you have identified in (b). [6]
- (d) Discuss what a designer would need to consider when selecting materials for a step ladder in order to ensure that they are suitable for the purpose. Your answer should:
- (i) analyse the given situation and identify three relevant issues raised by the question; [3]
 - (ii) explain why you consider these three issues to be relevant; [3]
 - (iii) contain specific examples/evidence as support for your conclusions. [2]

Section C

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

You are provided with three sheets of plain A3 paper. You should use **both** sides of the paper. **Each** of the five parts **(a) – (e)** 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 sketches and notes, the development and evaluation of a **range** of ideas into a single design proposal. The design proposal should be annotated to give details about materials, joining methods and important sizes.

7 Fig. 8 shows an incomplete idea for a child's combined desk and chair.

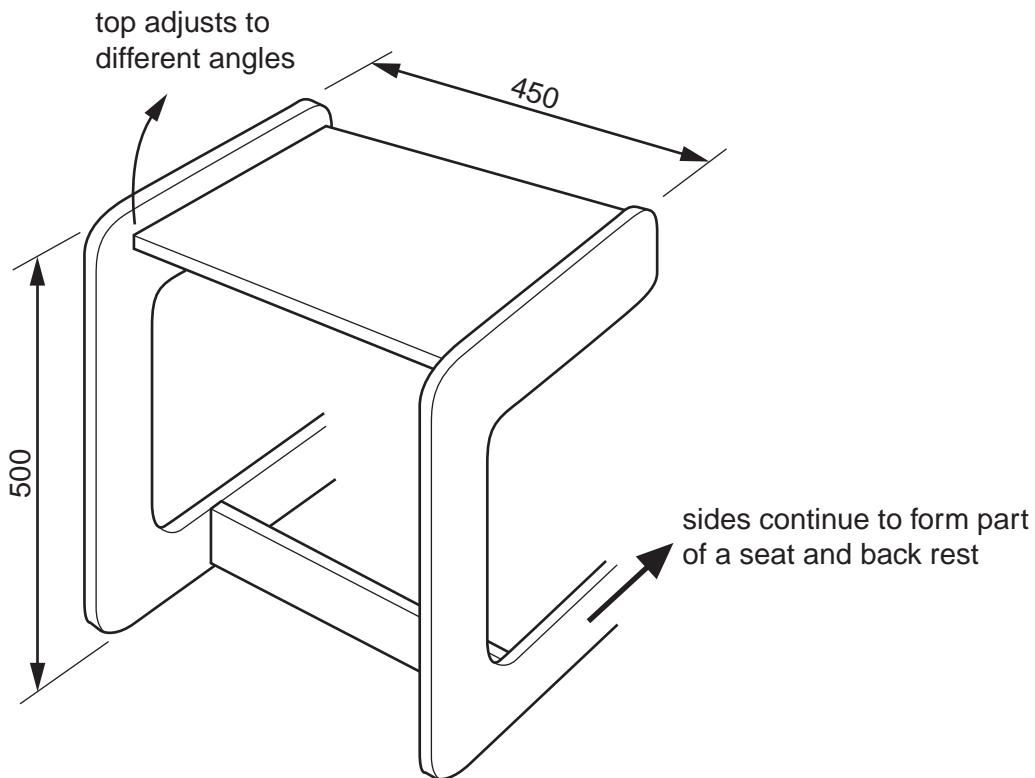


Fig. 8

- (a) Using notes and sketches, develop a design which continues the side frames of the desk to form a seat with a back rest. [16]
- (b) Using notes and sketches, develop a design which allows the top of the desk to be adjusted and fixed at different angles. [16]
- (c) Using notes and sketches, develop a design for a drawer to go under the desk. [16]
- (d) Using notes and sketches, develop a design for a detachable tray to hold pens, pencils etc. which could be fixed to, and easily removed from, the side of the desk. [16]
- (e) Produce a pictorial rendered drawing of the complete desk and seat which shows all of the features that you have designed in (a) – (d). [16]

- 8 Fig. 9 shows an incomplete idea for a point of sale display stand advertising a new disc). The display stand is made from card.

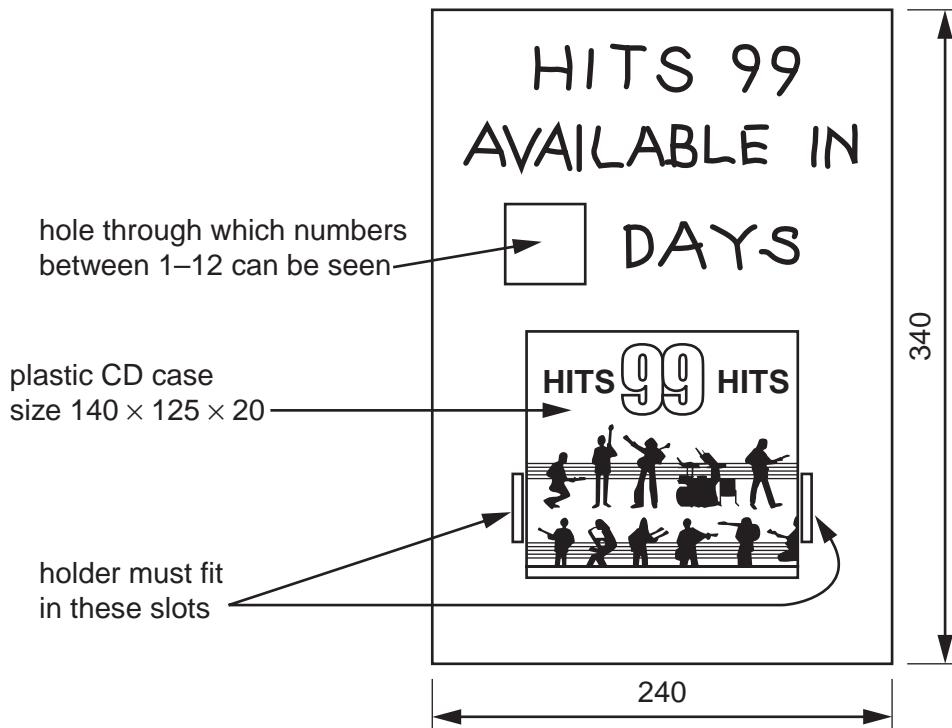


Fig. 9

- (a) Using notes and sketches, develop a design for a holder to support the CD case. The holder must fit into the two slots shown on the stand and lock in place without the use of glue or other additional materials. The holder must not cover up any of the design on the CD case. [16]
- (b) Using notes and sketches, develop a design which can be attached to the back of the stand and allow different numbers to be seen through the hole in the stand. It must be possible to change the numbers easily. [16]
- (c) Using notes and sketches, develop a design for a support which folds out from the back of the stand and locks securely in place to prevent the stand falling backwards. [16]
- (d) Using notes and sketches, develop a design for the lettering shown in Fig. 9 to go on the stand in the given position. [16]
- (e) Produce an exploded pictorial rendered drawing of the complete point of sale display stand which shows all of the features that you have designed in (a) – (d). Do not include the CD case in this drawing. [16]

- 9 Fig. 10 shows an incomplete idea for a toy roundabout (carousel).

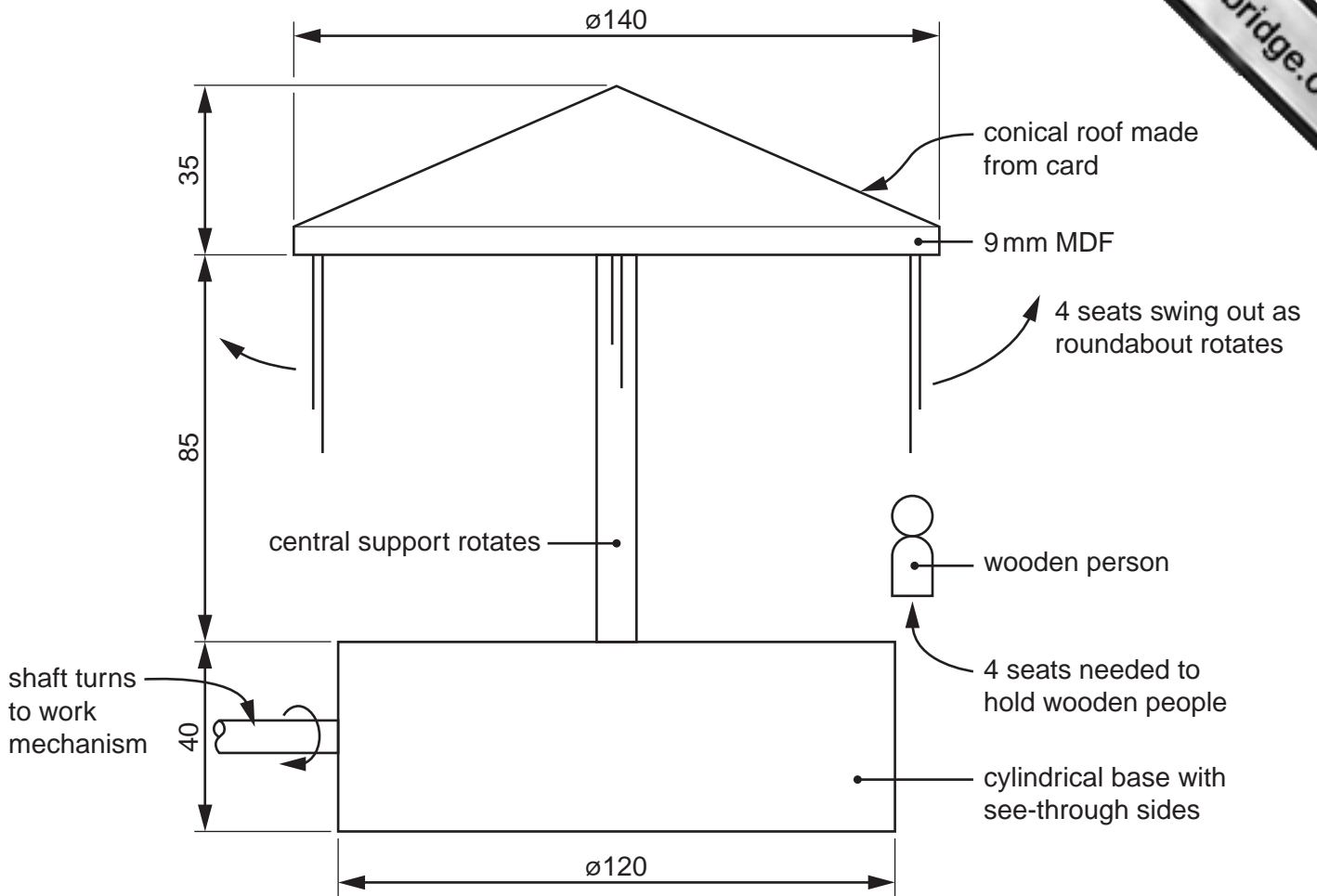


Fig. 10

- (a) Using notes and sketches, develop a design for a mechanism which makes the roundabout rotate when the shaft is turned. [16]
- (b) Using notes and sketches, develop a design which enables the shaft to be rotated and prevents it being pulled out of the base. The design must be easy and comfortable for a child to use. [16]
- (c) Using notes and sketches, develop a design for the cylindrical base, with see-through sides, that holds the mechanism. [16]
- (d) Using notes and sketches, develop a design for the seats to hold the wooden people and a method of suspending them from the roof which allows them to swing out when the roundabout rotates. [16]
- (e) Produce a pictorial rendered drawing of the complete toy roundabout which shows all of the features that you have designed in (a) – (d). [16]

