

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

DESIGN AND TECHNOLOGY

9705/1

PAPER 1

OCTOBER/NOVEMBER SESSION 2002

2 hours 30 minutes

Additional materials:
Answer paper

TIME 2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces provided on the answer paper/answer booklet.

Section A

Answer **all** questions.

Section B

Answer any **two** questions.

Section C

Answer any **two** questions.

Write your answers on the separate answer paper provided.

If you use more than one sheet of paper, fasten the sheets together.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets [] at the end of each question or part question.

All dimensions are in millimetres.

The instruction 'discuss' denotes that you should:

- examine critically the issues raised by the question;
- explain and interpret these issues as appropriate;
- introduce evidence wherever possible to support conclusions of arguments.

This question paper consists of 8 printed pages.

Section A

Answer **all** questions.

- 1** List any **three** types of temporary fixing used in metal, wood or plastic products. [3]
- 2** Copper is usually used in electrical cables.
- (a) Give **two** reasons why this is so. [2]
- (b) Name a suitable material for the cable insulation. [1]
- 3** Describe **four** important properties or characteristics a material should have when used in the manufacture of a simple kitchen utensil. [8]
- 4** Describe, with the aid of sketches and notes, the following types of 'gear'. Give an application for **each**.
- (a) Bevel gears. [4]
- (b) Rack and pinion. [4]
- 5** There are several ways of producing energy from water.
- For each of the following, outline briefly the key stages of producing electricity:
- (a) tidal; [3]
- (b) hydroelectric; [3]
- (c) wave. [3]
- 6** When planning the production of work in a school workshop, it is important that resources are used efficiently.
- Identify and discuss the factors that must be considered in connection with each of the following:
- (a) time; [3]
- (b) facilities; [3]
- (c) materials. [3]

Section B

Answer **two** questions from this section.

7 Fig. 1 shows an outline view of a video cassette storage unit to be made in a school workshop.

The unit is to hold 6 video cassettes. One cassette is shown in position.

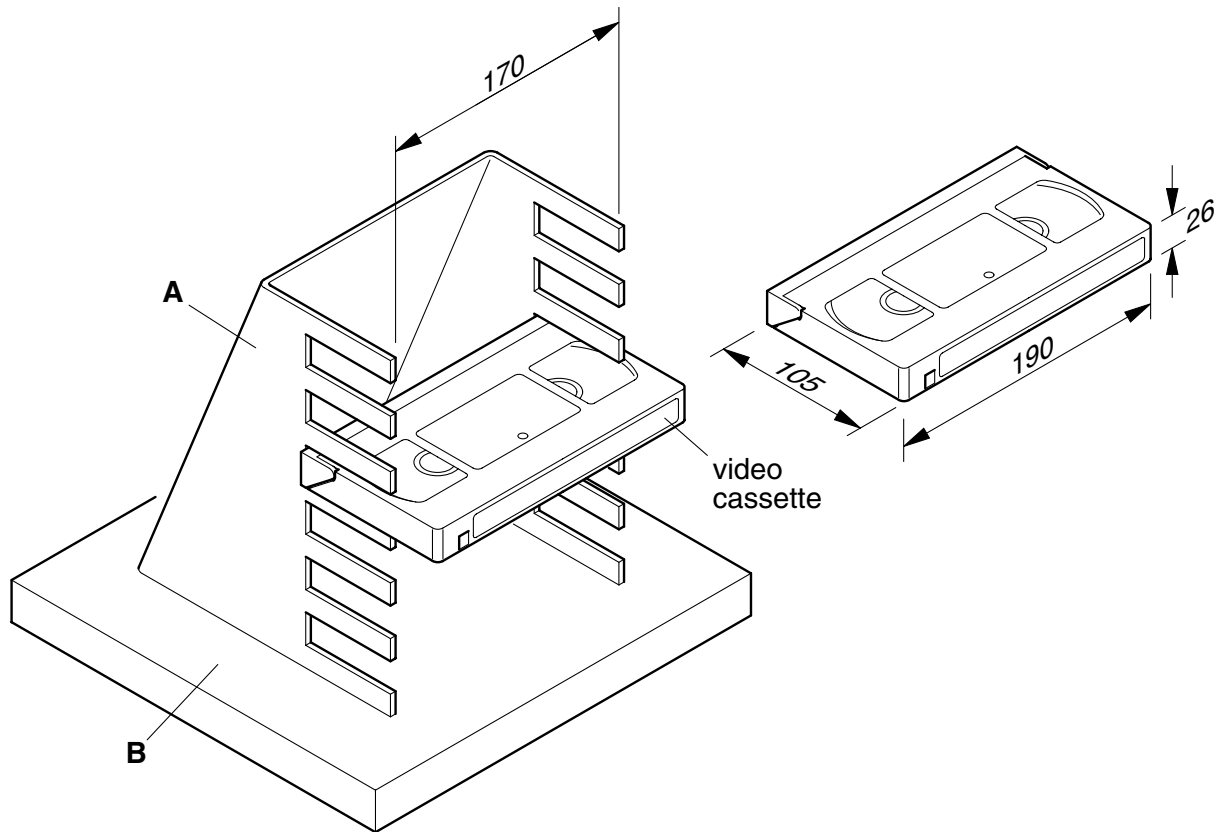


Fig. 1

- (a) Name a suitable plastic for part **A** and a timber for part **B**. [2]
- (b) Use sketches and notes to describe how you would manufacture part **A**. Your answer must include details of any former or mould that you would use, and a suitable method of producing the slots accurately. [10]
- (c) Use sketches and notes to show a method of attaching part **A** to the base **B**. [4]
- (d) Show suitable shaping to be carried out to parts **A** and **B**. [4]

- 8 An outline design for an adjustable table to be used by hospital patients is shown in Fig. 2.

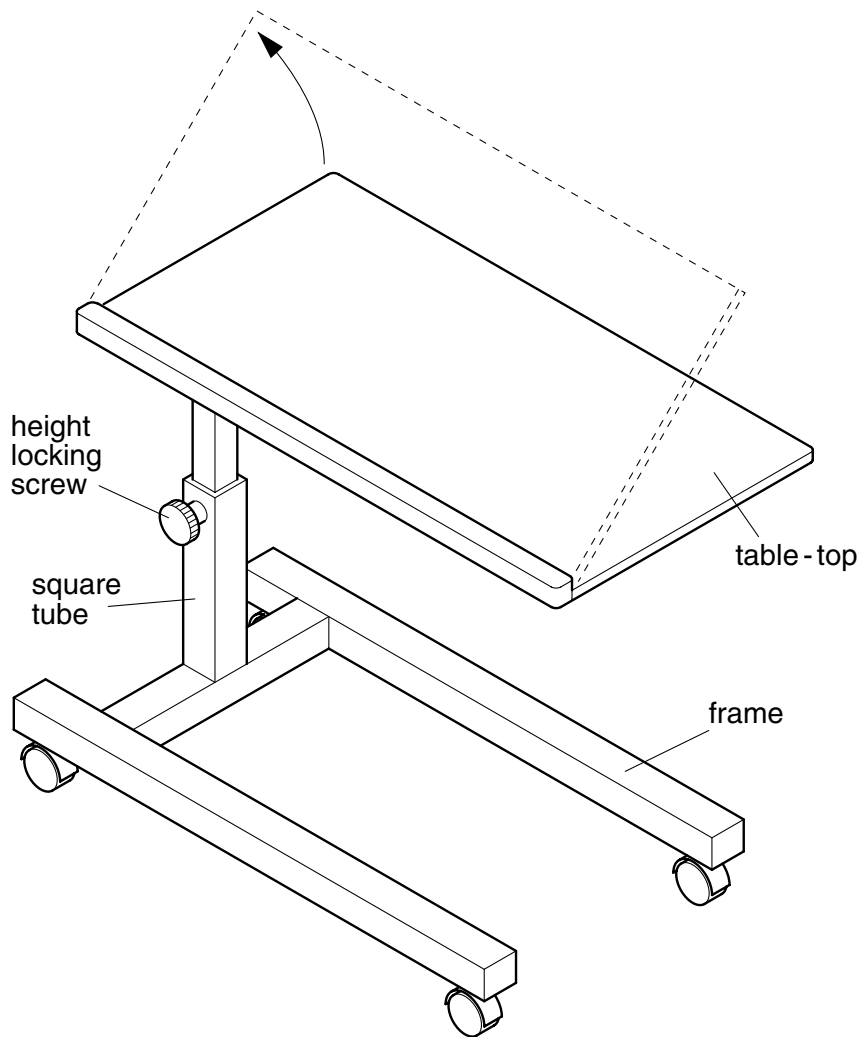


Fig. 2

- (a) The framework can be made from either aluminium or mild steel. Give **one** advantage and **one** limitation for **each**. [4]
- (b) Give **two** reasons why square tube may be better than round tube for the frame. [4]
- (c) Choose **one** of the metals from part (a) and describe, using notes and sketches, how the framework could be joined together. [8]
- (d) Sketch a method that will enable the table-top to pivot upwards so that the patients can read books. [4]

- 9 Litter is a problem in many schools. You have been set the task of designing and making a device that can be used to pick up litter easily and quickly from a variety of surfaces.
- (a) Make a list of **four** important points to be considered when designing the device. [4]
- (b) Produce detailed notes and sketches of **two** alternative designs for the device. Specify suitable materials and show the **key** construction details. [8]
- (c) Select **one** of your designs and produce a table or chart that shows:
- the stages of manufacture;
 - the tools needed;
 - the machinery needed;
 - any health and safety issues. [8]

Section C

Answer **two** questions from this section.

10 Fig. 3 shows an example of outdoor play equipment for young children.

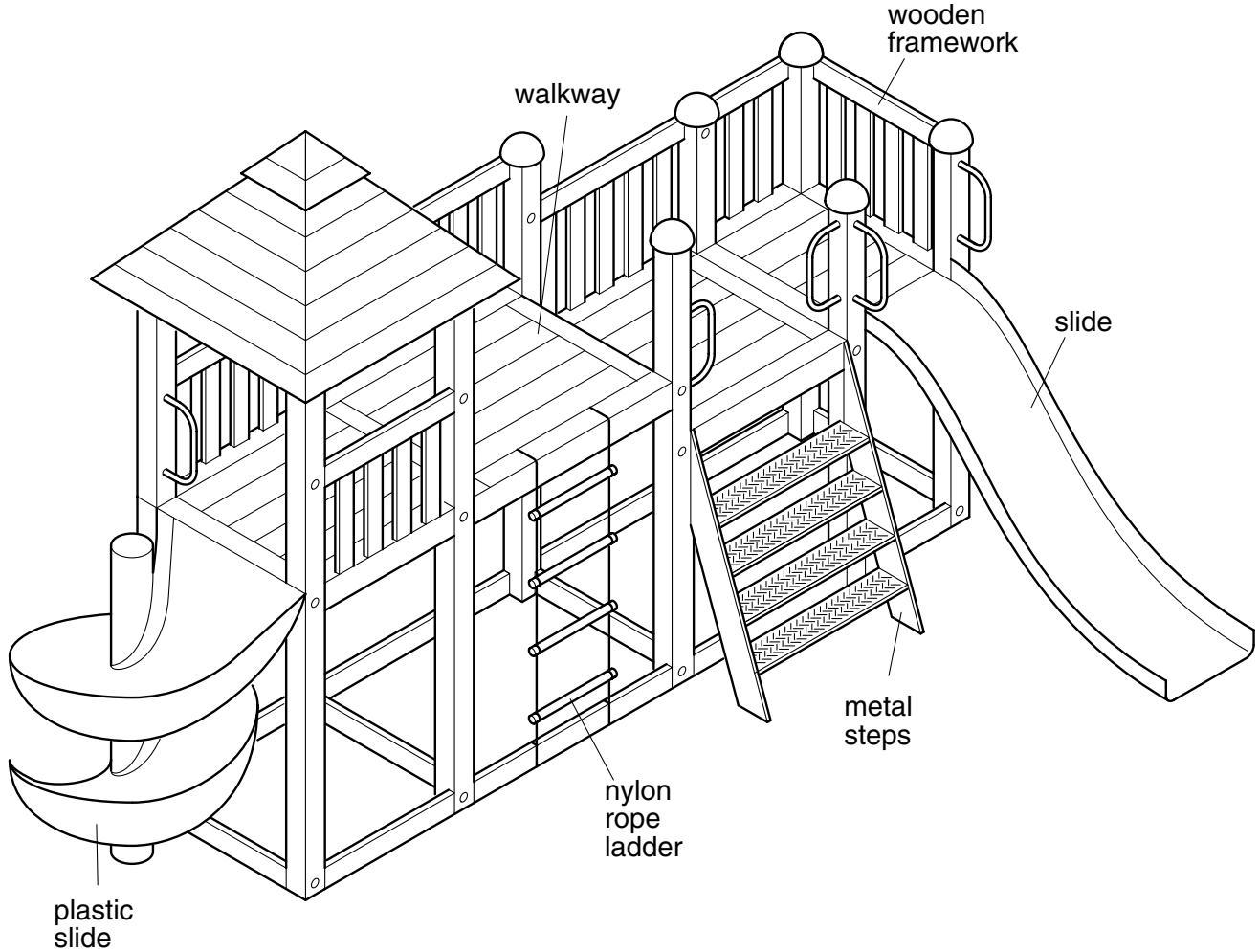


Fig. 3

- (a) List the main design considerations for this type of equipment. [4]
- (b) Discuss, with detailed reference to **two** parts of the outdoor play equipment, why different materials are used. [16]

11 Fig. 4 shows a toy designed for children, made predominantly of wood.

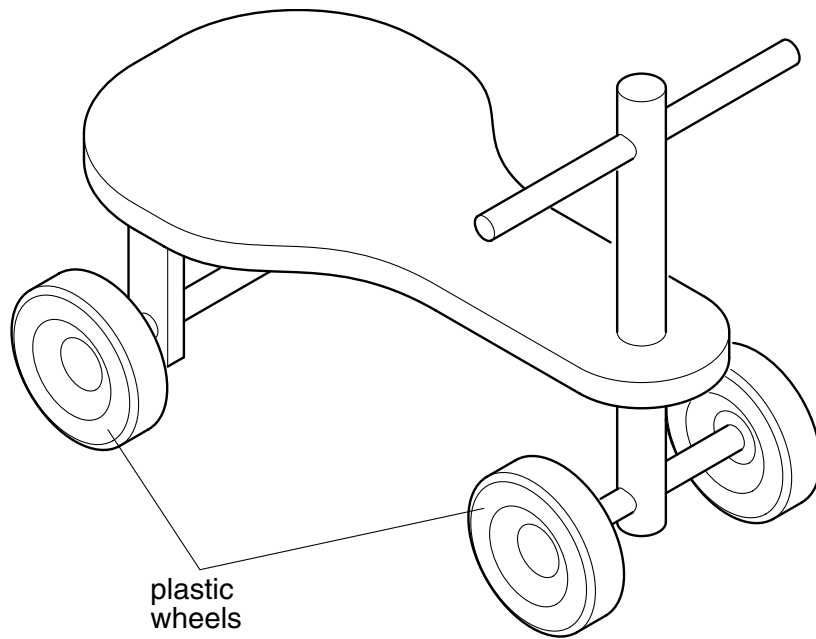


Fig. 4

- (a) List **four** design requirements for this type of toy. [4]
- (b) Identify **three** advantages and **three** limitations of wood when used for toys. [6]
- (c) Select an example of a toy for young children which is manufactured mainly from plastic.
- (i) Sketch the toy and identify the specific materials used. [4]
- (ii) Describe, with the aid of diagrams, the manufacturing process used to produce the main part of your selected toy. [6]

12 Fig. 5 shows a chair frame made from laminated timber and a chair frame made from metal tube.

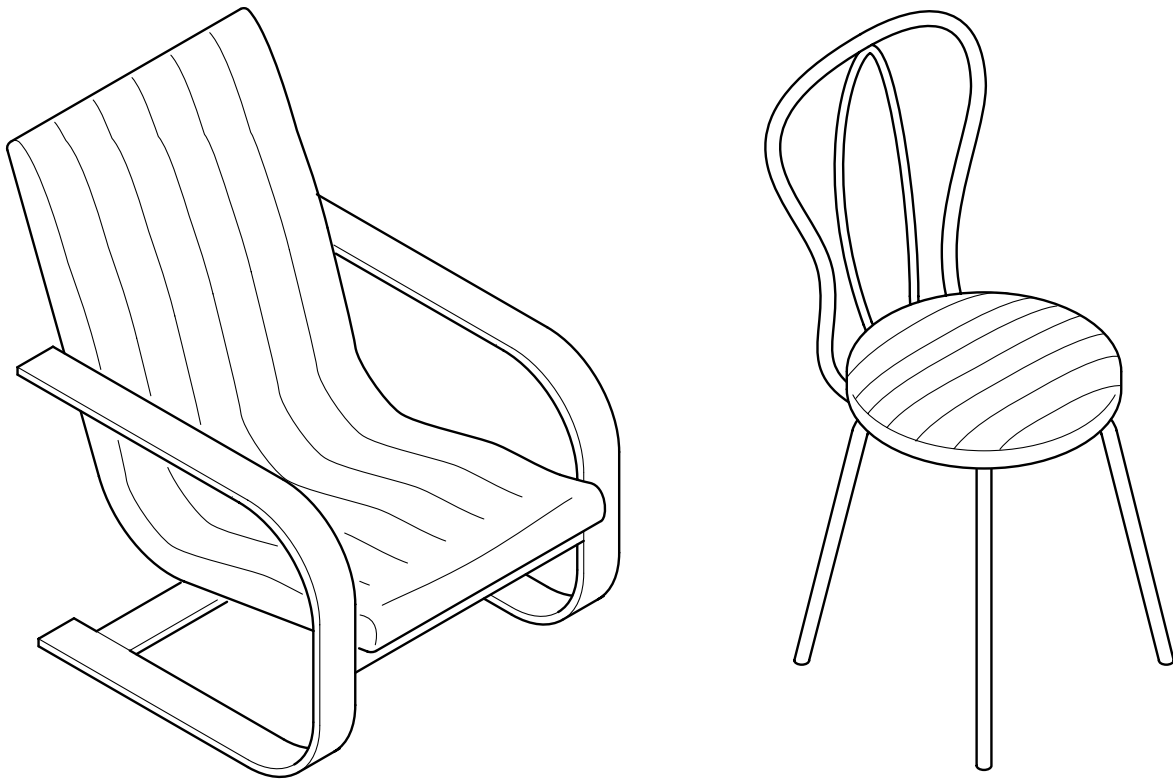


Fig. 5

- (a) Suggest a suitable specific material for the production of **each** chair frame. [2]
- (b) Discuss **two** advantages and **two** limitations of **each** material you have chosen. [8]
- (c) Describe, with the aid of diagrams, the method of producing one of the side frames on the laminated timber chair. [5]
- (d) Explain how the shape of this laminated chair may have been influenced by this production method. [5]