

**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.

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**This question paper consists of 8 printed pages.**

**Section A**

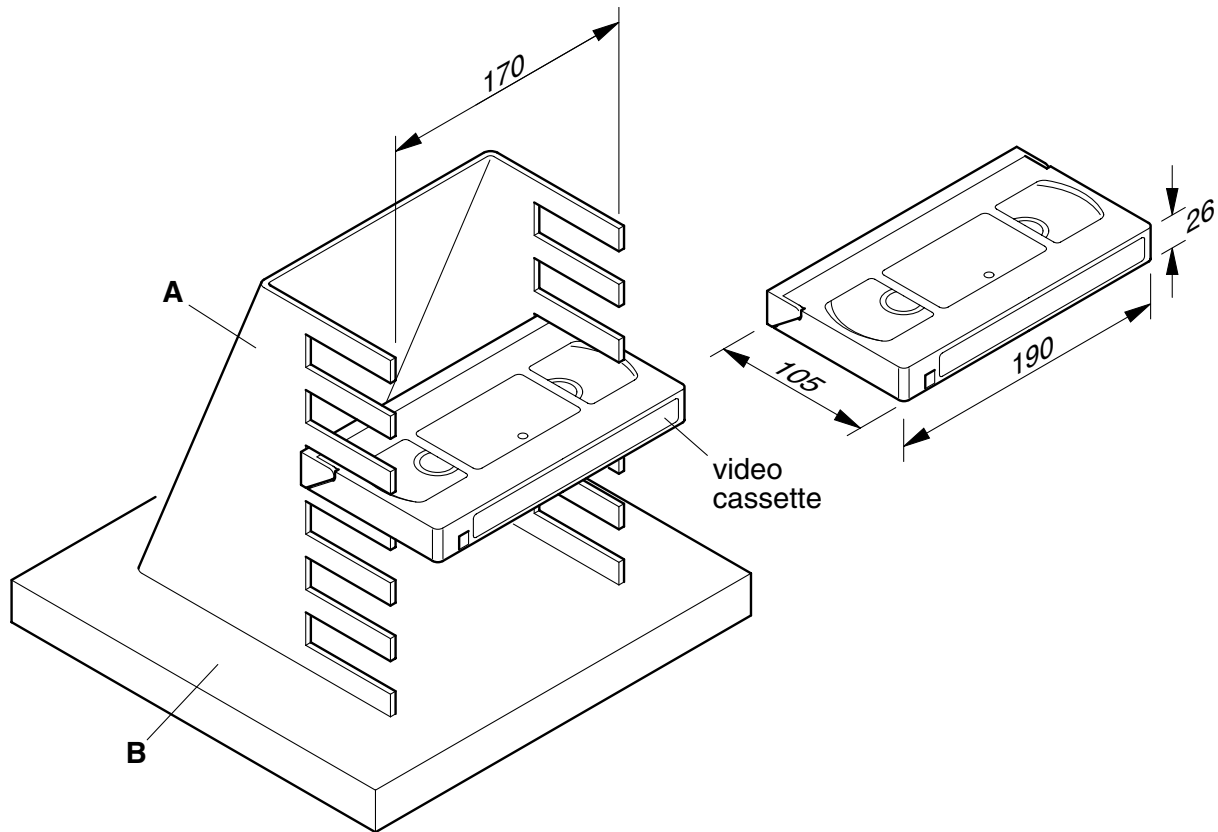
Answer **all** questions.

- 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.

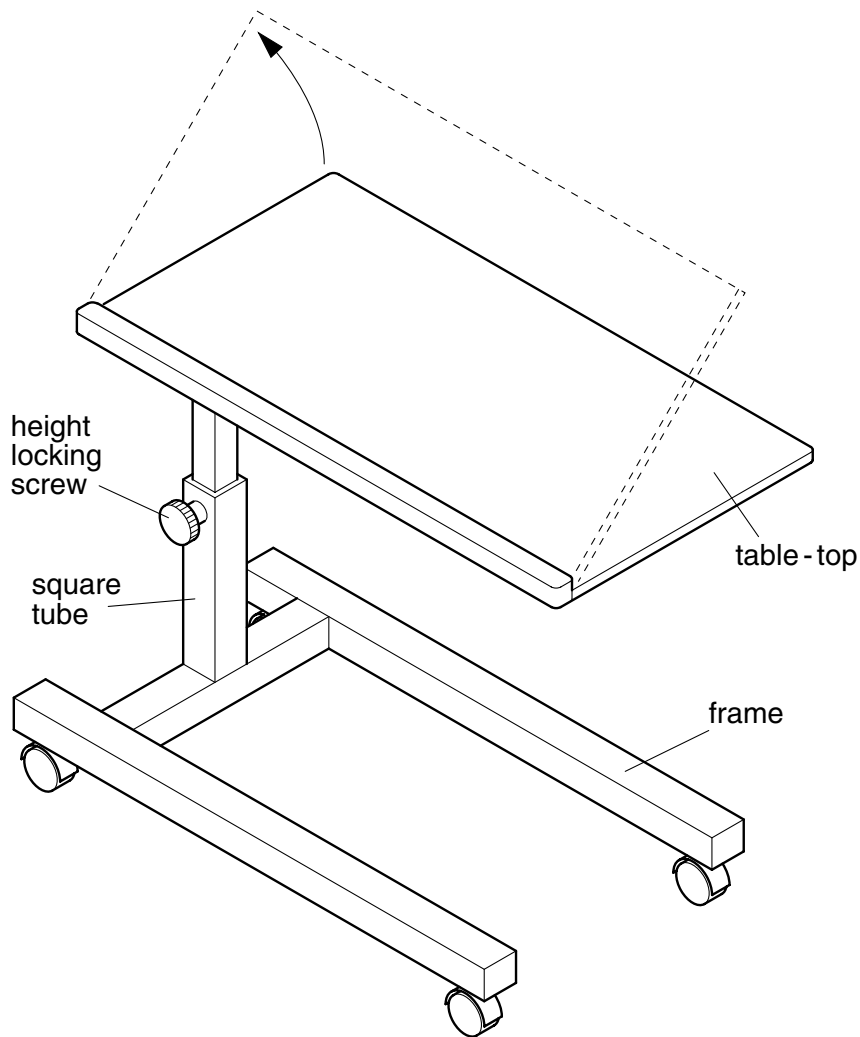
- 7 Fig. 1 shows an outline view of a video cassette storage unit to be made in a school workshop. The unit is to hold 6 video cassettes. One cassette is shown in position.



**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**

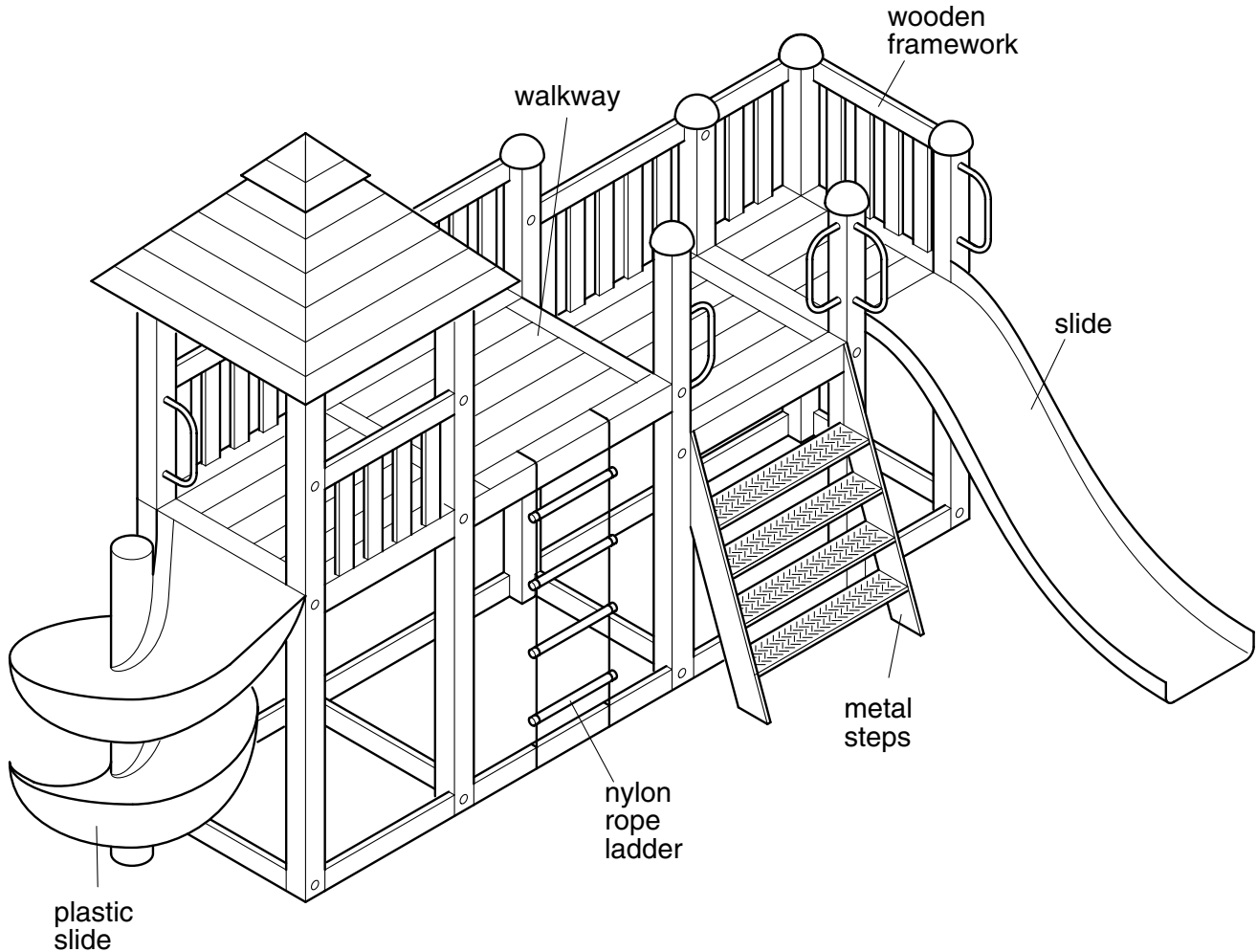
- (a) The framework can be made from either aluminium or mild steel. Give **one** advantage and **one** limitation for **each**. [4]
- (b) Give **two** reasons why square tube may be better than round tube for the frame. [4]
- (c) Choose **one** of the metals from part (a) and describe, using notes and 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.

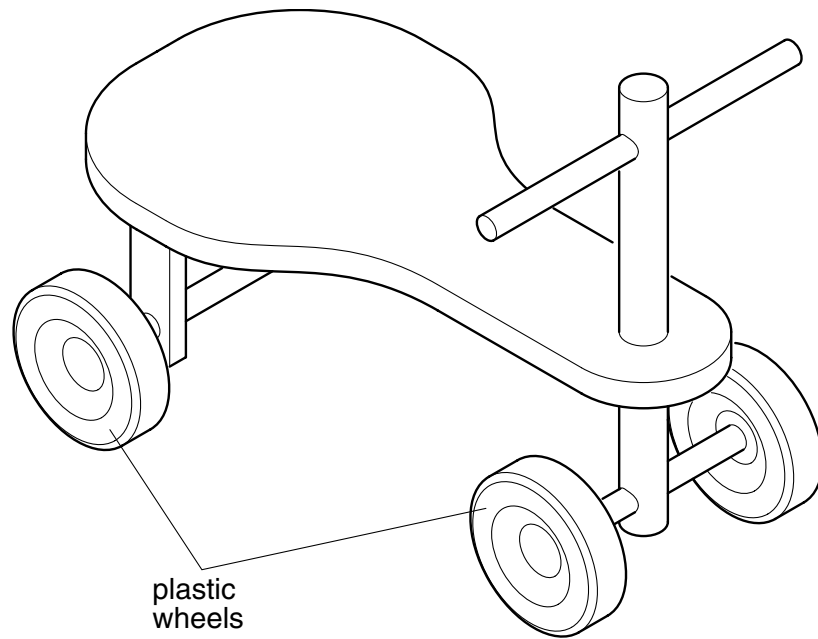
10 Fig. 3 shows an example of outdoor play equipment for young children.



**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]

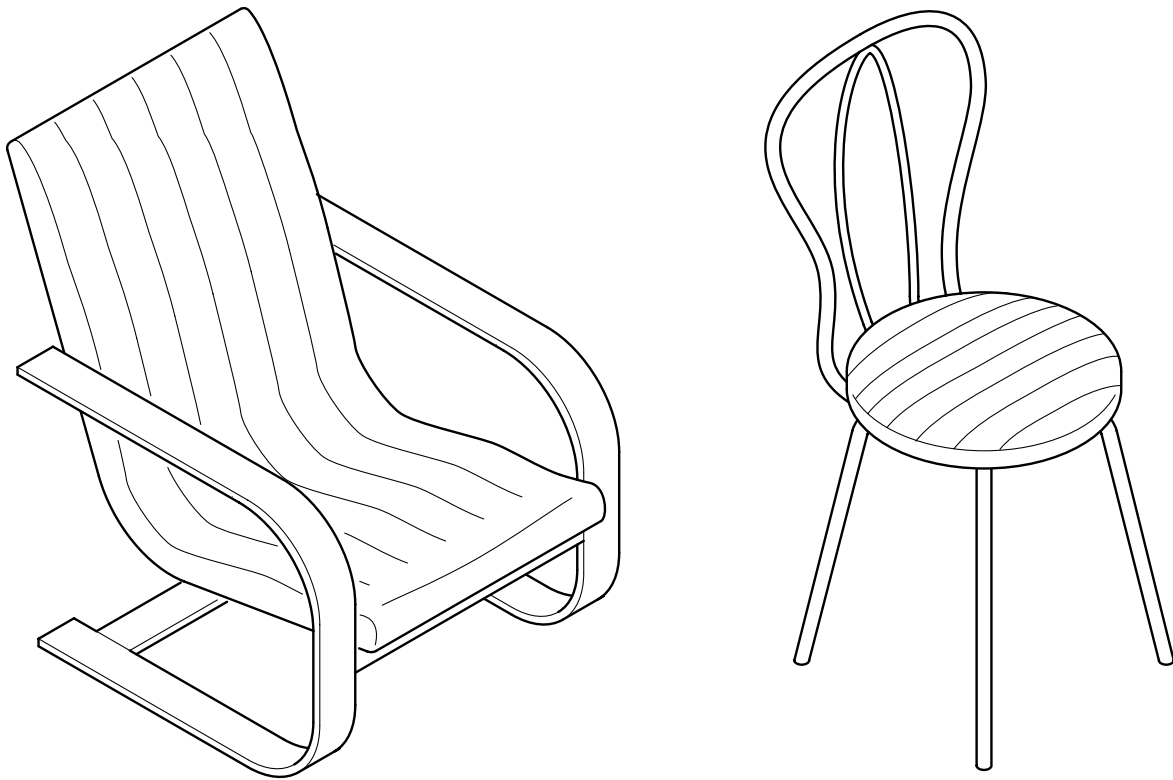
11 Fig. 4 shows a toy designed for children, made predominantly of wood.



**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]