#### **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.



# Section A

# Answer all questions.

1	List	any three types of temporary fixing used in metal, wood or plastic products.	[3]
2	Cop	oper is usually used in electrical cables.	
	(a)	Give <b>two</b> reasons why this is so.	[2]
	(b)	Name a suitable material for the cable insulation.	[1]
3		scribe <b>four</b> important properties or characteristics a material should have when used in nufacture of a simple kitchen utensil.	the [8]
4 Describe, with the aid of sketches and notes, the following types of each.		scribe, with the aid of sketches and notes, the following types of 'gear'. Give an application ${f h}$ .	for
	(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.

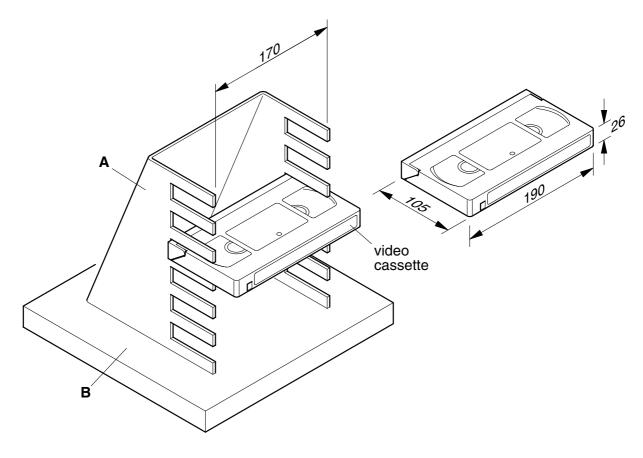


Fig. 1

- (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]

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

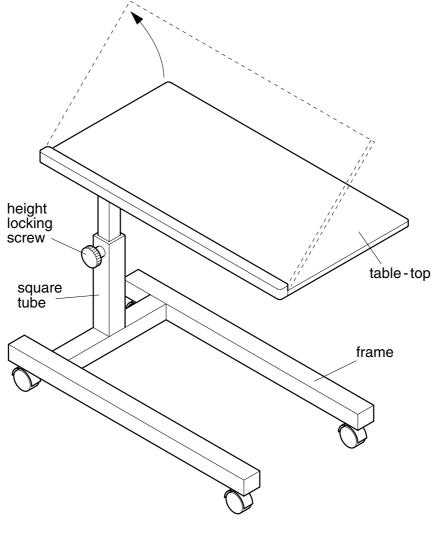


Fig. 2

- (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]

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## **Section C**

Answer two questions from this section.

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

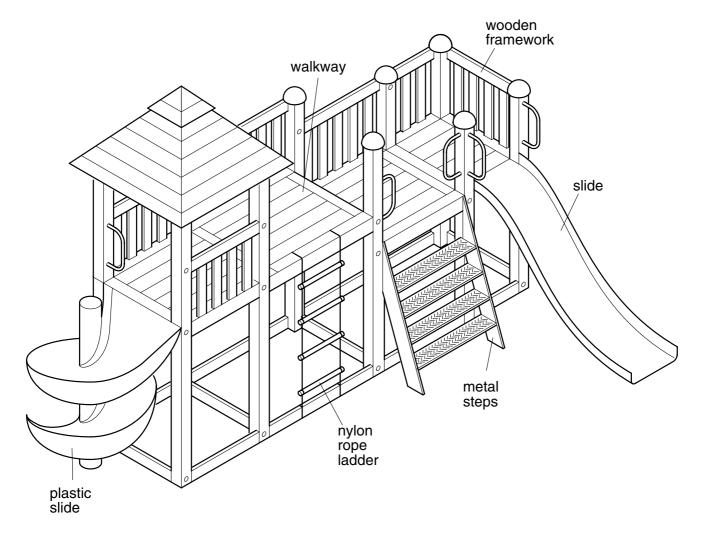


Fig. 3

(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.

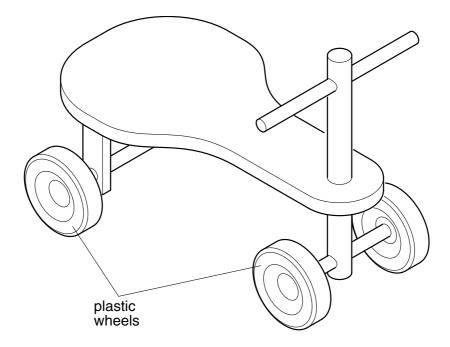


Fig. 4

- (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]

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

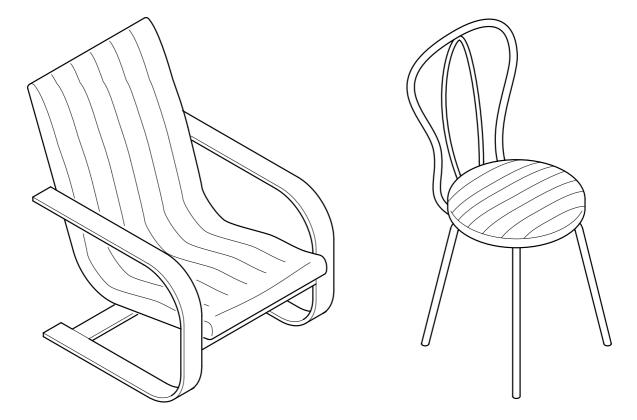


Fig. 5

- (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]