

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

DESIGN AND TECHNOLOGY
PAPER 1

9705/1
MAY/JUNE 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 Use examples to explain **each** of the following production techniques:

- (a) one-off; [2]
- (b) batch; [2]
- (c) continuous flow. [2]

2 Use an example to show how fashion has influenced the design and manufacture of a product. Use sketches and notes to help as much as possible. [8]

3 Fig. 1 shows a simple pencil holder.

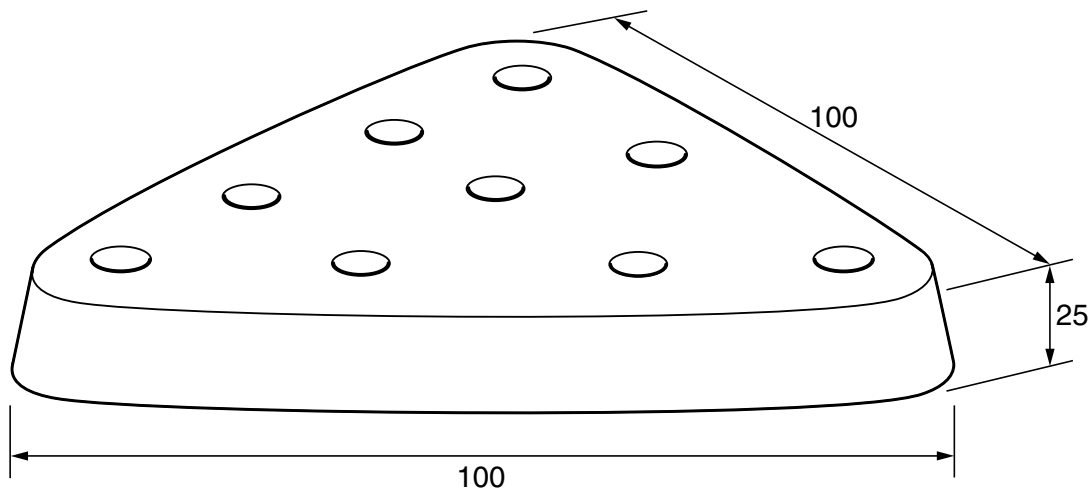


Fig. 1

- (a) State **two** different materials from which the pencil holder could be made. [2]
- (b) For **each** material describe **two key** properties that make it suitable for the product. [4]
- (c) For **one** of the materials you suggested in part (a), outline the method of creating the holes. Include tools, equipment and safety features. [4]

- 4 A range of garden furniture is to be made from softwood.
- (a) Suggest a suitable finish which would protect **and** decorate the garden furniture. [1]
- (b) Outline the correct method of preparation of the material and application of the finish including the working environment and care of the tools used. [4]
- 5 (a) Explain the term 'mechanical advantage'. [2]
- (b) Draw an example of a lever and label the effort, fulcrum and load. [2]
- 6 The frame for a self-assembly glass topped table is to be made using either steel or aluminium tube.
- (a) For **each** material give **two** properties that make it suitable for the table frame. [4]
- (b) Sketch a suitable self-assembly method of fixing any **two** of the parts together. [3]

Section B

Answer **two** questions from this section

- 7 Fig. 2 shows the outline of a video cassette storage unit made mainly from hardwood. The video cassettes are shown in position.

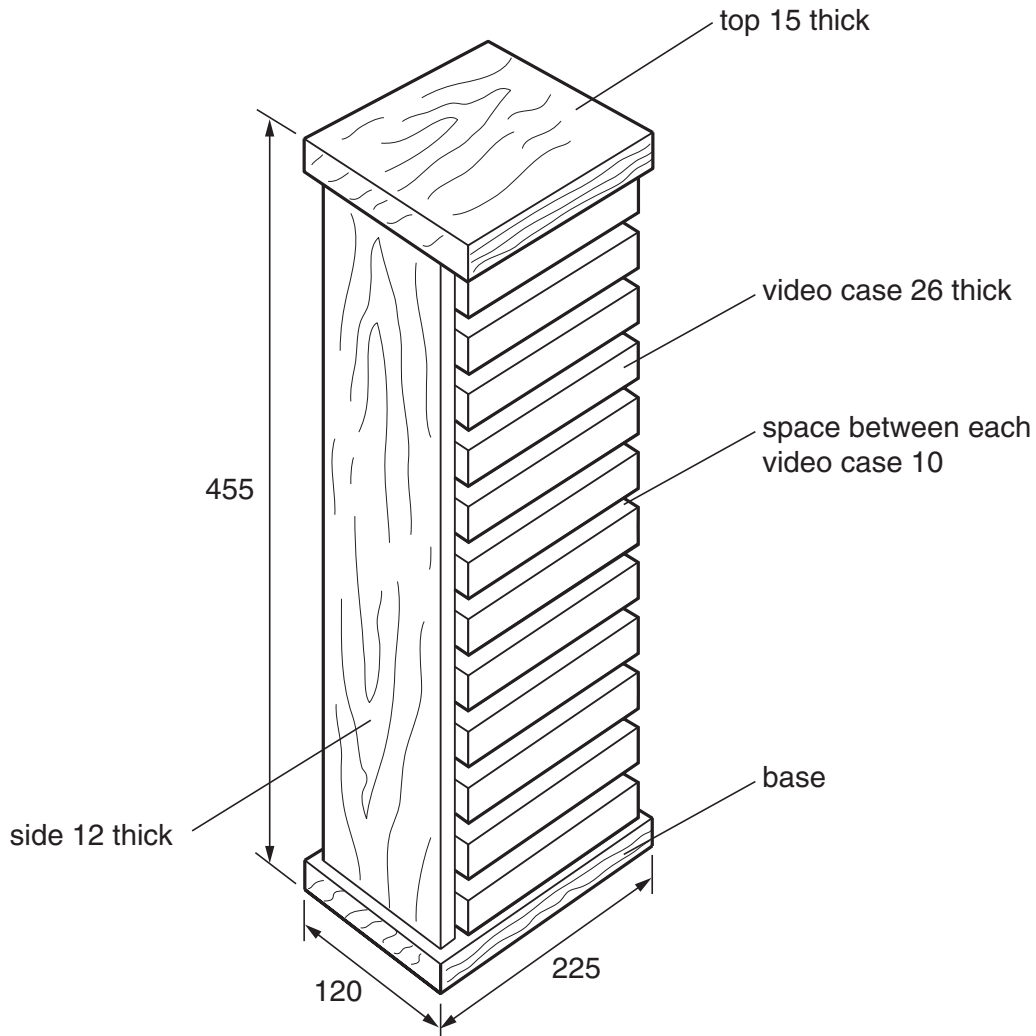


Fig. 2

- (a) Select a suitable hardwood for the unit and give **two** reasons for your choice. [3]
- (b) Use sketches and notes to describe the preparation of the materials and the major stages of joining the top and base to the sides. [8]
- (c) Consider the number of video cassettes to be stored and use sketches and notes to describe a suitable method of supporting each cassette. Give details of production and any tools and equipment used. [7]
- (d) Select a suitable finish for the unit and give **one** reason for your choice. [2]

- 8 Young children like push and pull along toys which often incorporate some form of additional movement.
- (a) Make a list of **four** important points to be considered when designing such a toy. [4]
- (b) Produce detailed notes and sketches of **two** alternative designs for the toy. Specify suitable materials and show construction details. [8]
- (c) Select **one** of your ideas and produce a table or chart that shows:
- the main stages of manufacture;
 - the tools required;
 - the machinery required;
 - any health and safety issues. [8]

- 9 Fig. 3.1 shows one of a set of storage boxes to be made in a school workshop. The box is to be used for storing screws of different sizes.

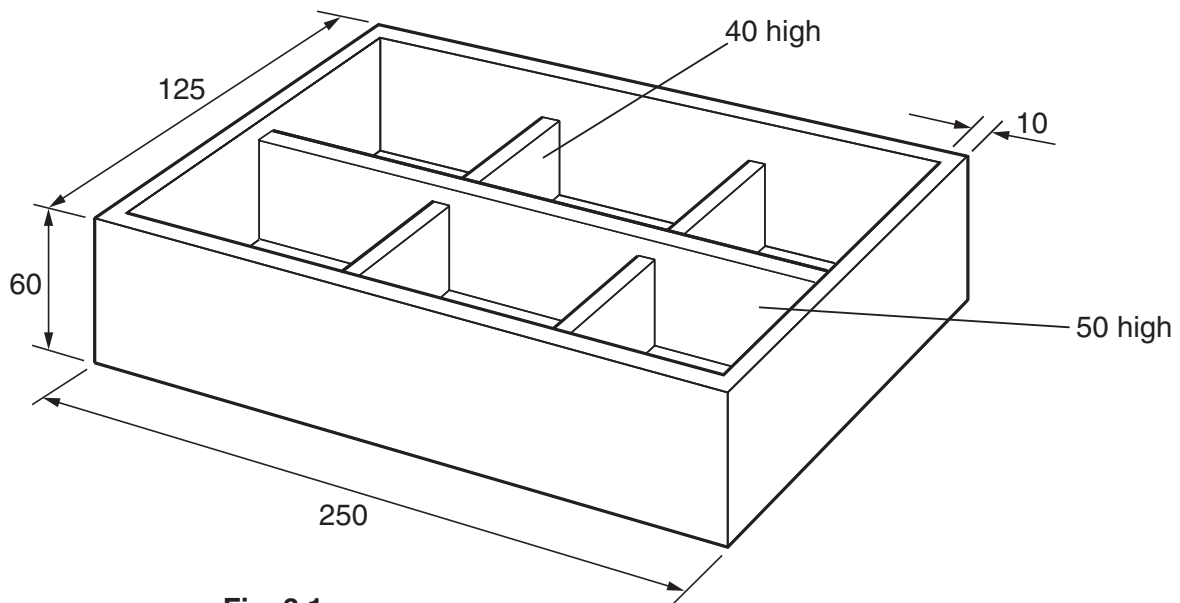


Fig. 3.1

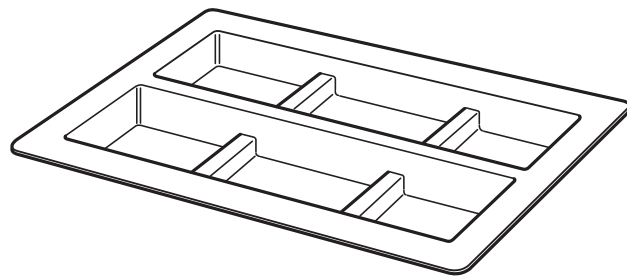


Fig. 3.2

- (a) Specify a suitable material for making the box and give **two** reasons for your choice. [3]
- (b) Use sketches and notes to describe the preparation of the material and the major stages of manufacturing the box. [8]
- (c) Explain, using notes and sketches, what modifications may be required and/or what jigs would be helpful in producing a batch of 30 boxes. [5]
- (d) A vacuum formed tray shown in Fig. 3.2 is to fit inside the top section of the box. Sketch a suitable former for making the tray, showing all details. [4]

Section C

Answer **two** questions from this section

10 Fig. 4 shows an electric carving knife.

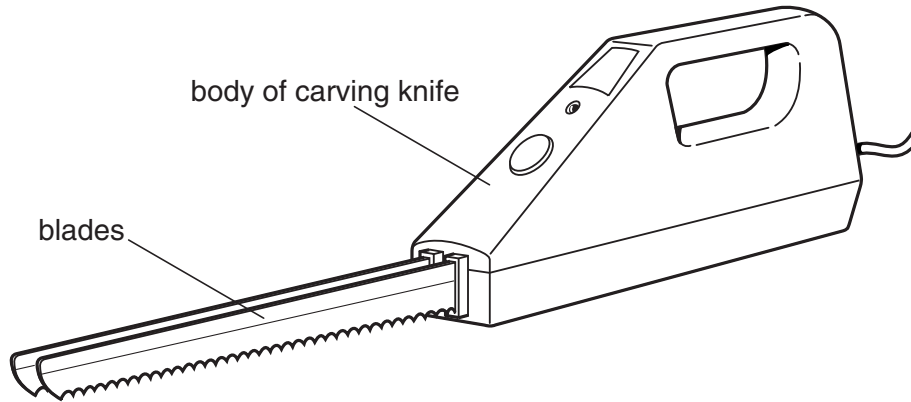


Fig. 4

- (a) Describe **three** properties which would be required in the material selected for the blade. [3]
- (b) Name a suitable plastics material for the body of the carving knife and explain **two** reasons for your choice. [3]
- (c) Using notes and sketches, show how the designer could improve **both** the safety of the product and also make it more comfortable to use. [6]
- (d) The body of the knife is made from two sections joined horizontally as shown. Using notes and detailed sketches show how the two sections of the body could be joined together. [8]

- 11 Fig. 5 shows a computer trolley with a square tubular steel frame and a tankard made from brass. Both examples use thermal joining techniques in their manufacture.

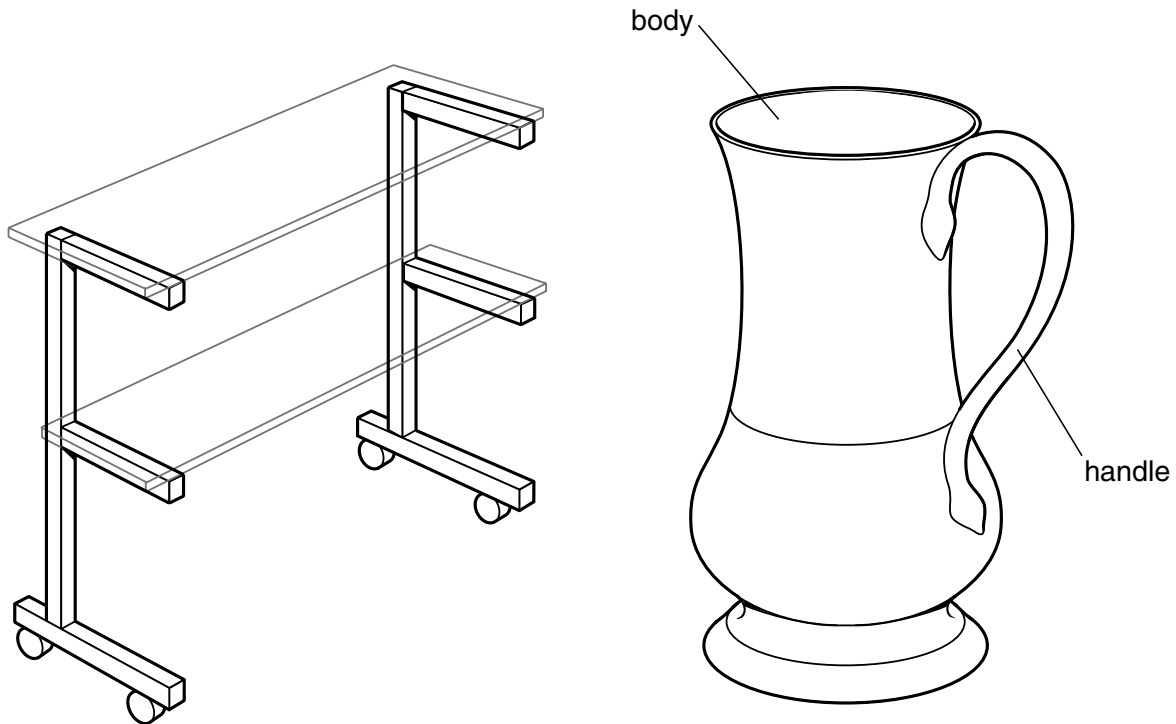


Fig. 5

- (a) Using notes and sketches, describe a suitable process for joining the metal parts of the computer trolley. [7]
- (b) Using notes and sketches, describe a suitable process for joining the handle to the tankard body. [7]
- (c) Assess the effectiveness of the joining techniques for **each** example in terms of:
- strength;
 - ease of use;
 - quality of finish. [6]
- 12 Manufacturers of volume-produced furniture are increasingly using manufactured boards.
- (a) Describe, with the aid of diagrams, **four** types of manufactured board used in the production of furniture. [4]
- (b) State **three** advantages and **three** limitations of manufactured board compared with solid timber. [6]
- (c) Select an example of a piece of traditional furniture made predominantly from solid timber. Show, using notes and sketches, **one** way in which the designer has overcome problems associated with shrinkage. [4]
- (d) Modern furniture often uses a combination of solid timber and manufactured board in its construction.
- Give an example to show how the manufacturer can make good use of the specific properties of **each** material. [6]