



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

DESIGN AND TECHNOLOGY

6043/01

Paper 1 Technology

October/November 2011

2 hours 30 minutes

Additional Materials: Answer Booklet/Paper
 Plain paper
 Sketching equipment



READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.

Write in dark blue or black pen.

You may use a soft pencil for any diagrams, graphs or rough working.

Do not use staples, paper-clips, highlighters, glue or correction fluid.

Part A

Answer **all** questions.

Part B

Answer **four** questions.

Answer **one** question from Section 1, **two** questions from Section 2, and **one** other question from either Section.

Use sketches where appropriate to help answer any question.

You are advised to spend no longer than 45 minutes on Part A and 1 hour 45 minutes on Part B.

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.

This document consists of **11** printed pages and **1** blank page.



Part A

You are advised to spend no more than 45 minutes on this part.

Attempt **all** questions.

- 1 Fig. 1 shows a beach chair.

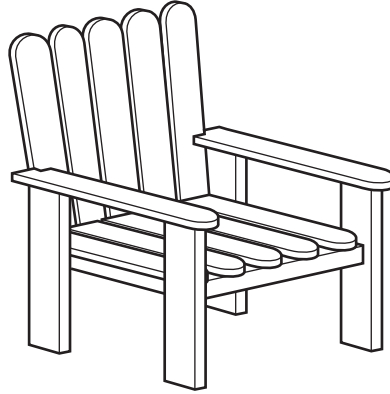


Fig. 1

State **two** effects hot weather will have on the wood.

[2]

- 2 Sketch the following joining devices.

(a) countersunk rivet

(b) round head machine screw

[4]

- 3 Plastics are produced in many different forms for further processing. State the form of the plastic needed for each of the following processes.

(a) dip coating

(b) injection moulding

(c) strip heating

[3]

- 4 Fig. 2 shows a wooden toy frog.

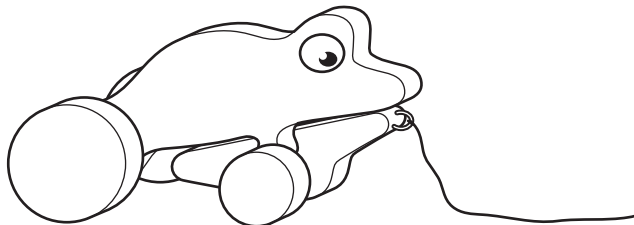


Fig. 2

Explain why any surface finish on the toy must be non-toxic.

[2]

- 5 Explain the term 'full scale mock-up' as used in the design process. [2]
- 6 Fig. 3 shows a bending jig. [2]

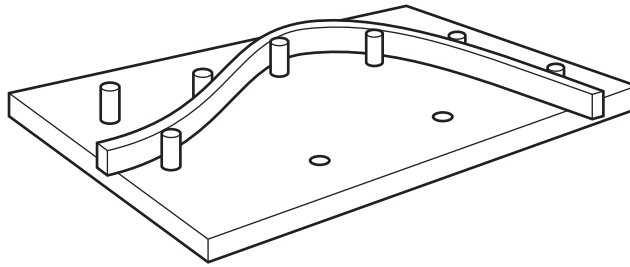


Fig. 3

State how each of the following materials would be prepared for bending.

- (a) meranti [3]
- (b) brass [3]
- (c) acrylic [3]
- 7 Name a suitable metal for:
- (a) electrical wires;
- (b) girders. [2]
- 8 Sketch the following fittings.
- (a) butt hinge
- (b) tee hinge [4]
- 9 State **two** forms of personal protection needed when working with glass-reinforced plastic. [2]
- 10 Name the piece of lathe equipment shown in Fig. 4 and state its use. [3]

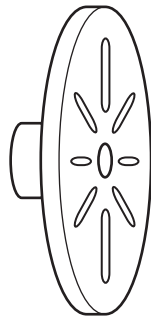


Fig. 4

Part B

You are advised to spend at least 1 hour 45 minutes on this part of the examination.

Attempt **four questions** including **one** from Section 1, **two** from Section 2 and **one** further question from either section.

All questions carry equal marks.

Section 1 - Tools and Materials

11 Fig. 5 shows three different marking out tools.

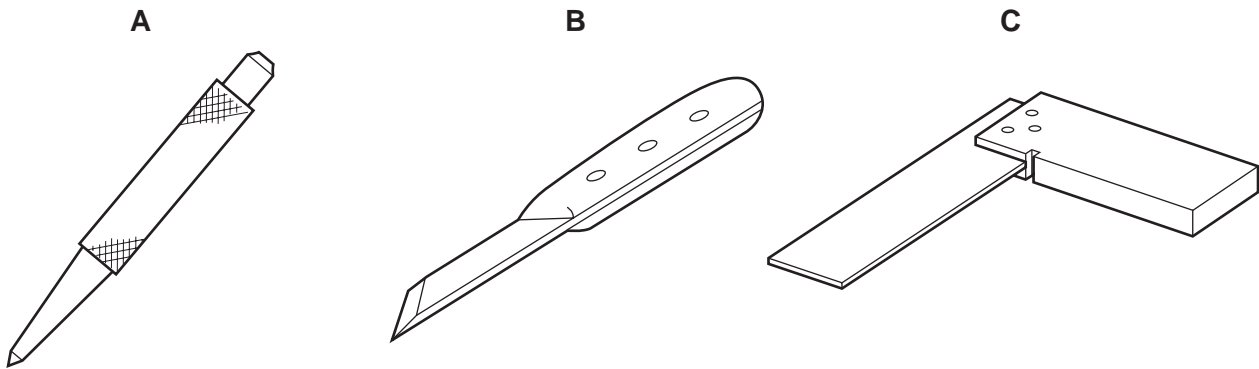


Fig. 5

- (a) Identify each tool shown in Fig. 5 and state its purpose. [6]
- (b) Explain:
- (i) the reason for the textured pattern on the body of tool **A**;
 - (ii) why only one side of the cutting blade is bevelled on tool **B**;
 - (iii) how tool **C** can be checked for accuracy. [9]
- (c) For marking out on acrylic, explain:
- (i) when a scriber may be used;
 - (ii) when a scriber should **not** be used. [2]

12 A wide variety of materials are used in the workshop.

(a) Copy and complete the chart below, giving the process and reason for use for each material.

| Material | Process/Use | Reason for use |
|-----------------|-------------------------|--|
| Chalk | Filing a piece of metal | To stop the file from clogging with waste material |
| Soft solder | | |
| Acid | | |
| Plastics cement | | |
| Wire wool | | |
| Sand | | |

[15]

(b) Explain how insects can damage wood.

[2]

13 The design for a bookmark is shown in Fig. 6.

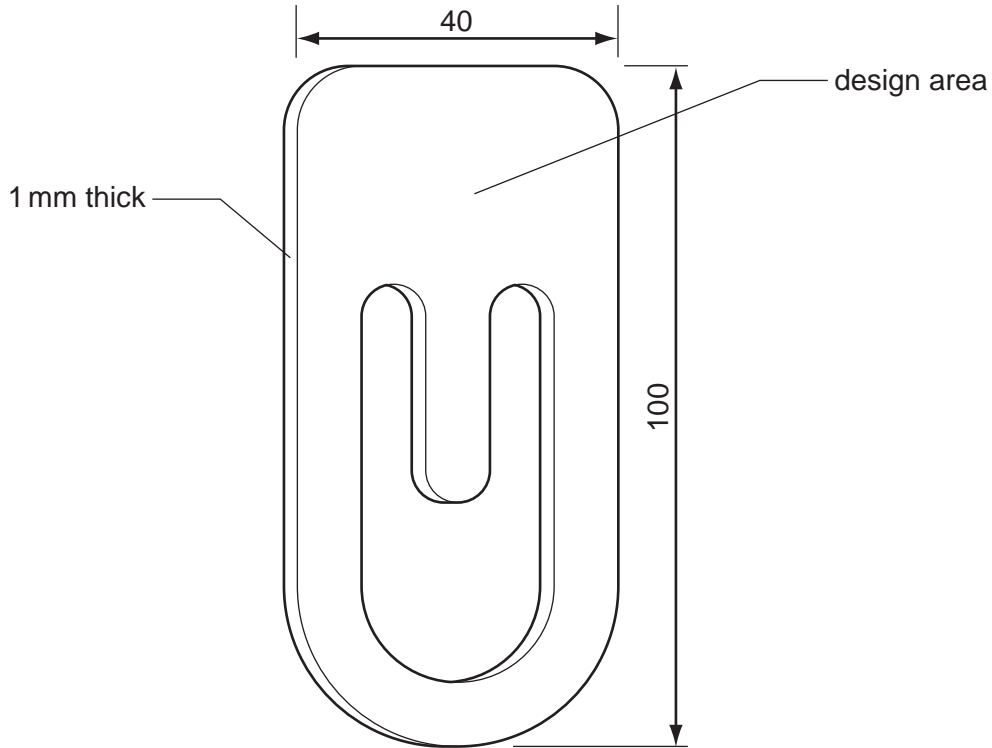


Fig. 6

- (a) State **two** properties that would be useful in a material used to make the bookmark. [2]
- (b) Explain why the following materials would be unsuitable for the bookmark.
- (i) expanded polystyrene
 - (ii) mild steel
 - (iii) chipboard [6]
- (c) State a material that would be suitable to make the bookmark. [1]
- (d) The cut out shape will be produced by drilling and the use of a piercing saw.
Use notes and sketches to show how the bookmark would be held and supported when:
- (i) drilling a pilot hole;
 - (ii) removing the waste with a piercing saw. [6]
- (e) Using a simple flower as a starting point, sketch a design for the design area shown in Fig. 6. [2]

Section 2 - Processes

14 Fig. 7 shows details of a test-tube holder.

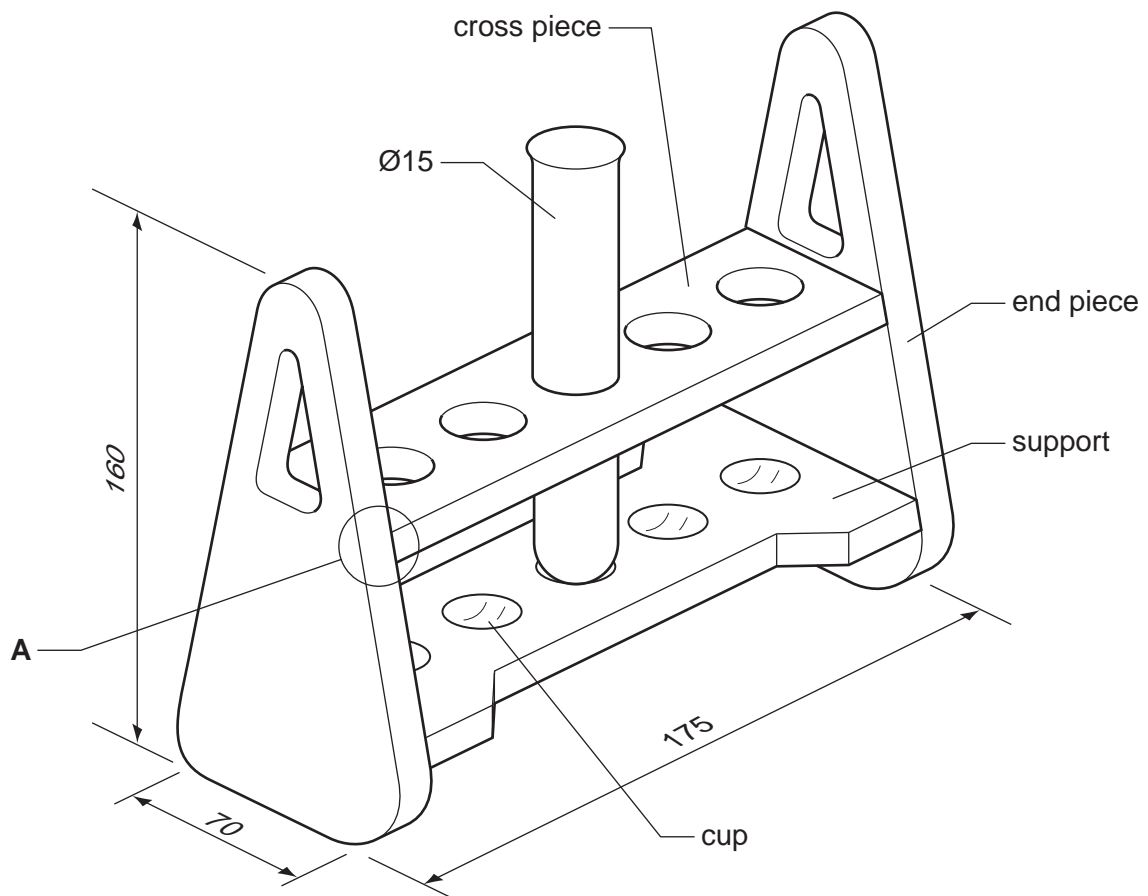


Fig. 7

- (a) Suggest a suitable material for the holder and give **one** reason for your choice. [2]
- (b) Using the material of your choice, describe, with the aid of notes and sketches, the following processes.
- (i) marking out the end pieces
 - (ii) drilling holes in the top cross piece so that they line up with the cups in the support
 - (iii) making the joint at **A** [15]

15 The design for an outdoor ring throwing game is shown in Fig. 8.

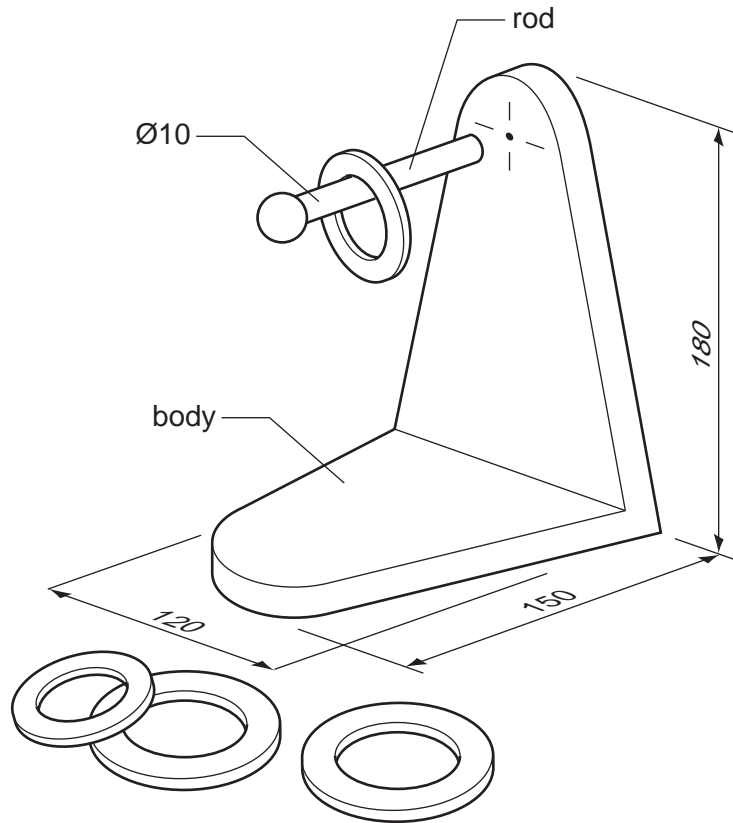


Fig. 8

(a) Give **two** properties that a material should have to be suitable for the ring game body. [2]

(b) Suggest a specific material which is suitable for the:

(i) body;

(ii) rod.

Give a reason for each.

[4]

(c) For the materials you have suggested, describe, using notes and sketches, the following stages.

(i) making the body

[7]

(ii) joining the rod to the body

[4]

16 The basic design for a mechanical toy is shown in Fig. 9.

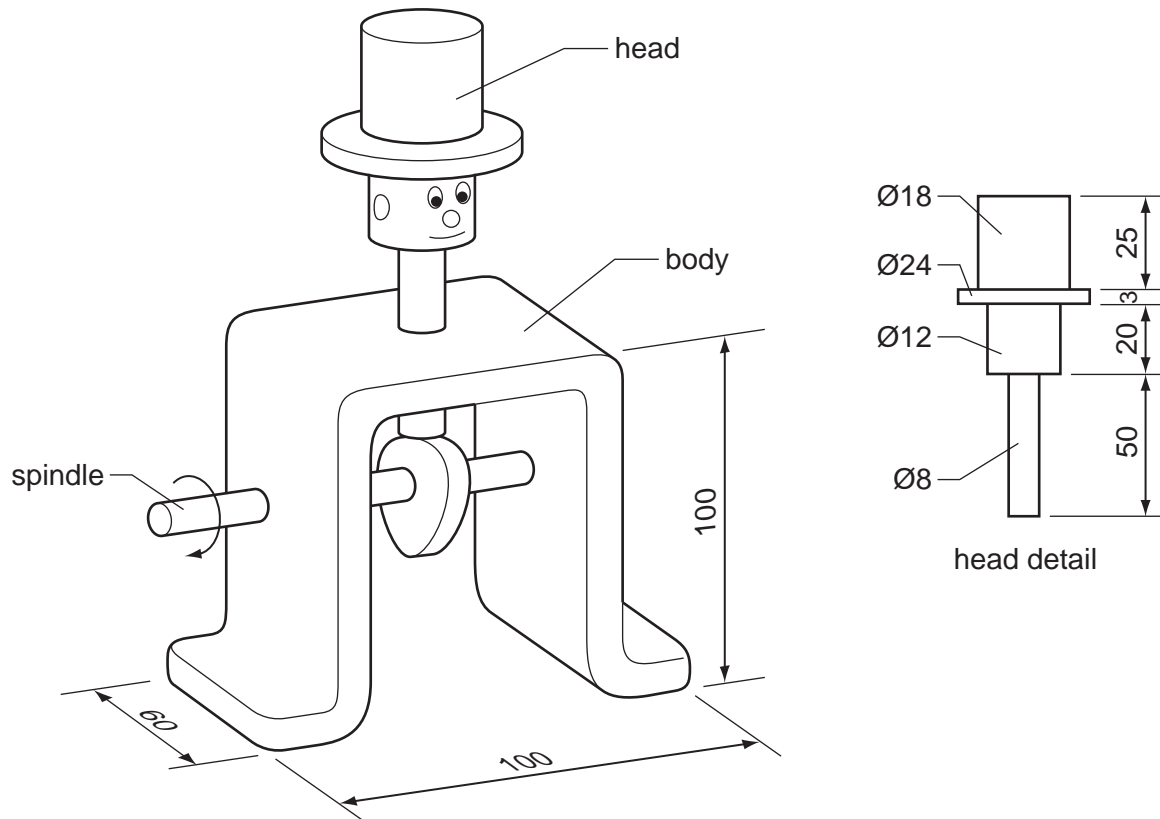


Fig. 9

- (a) Give **two** safety features that any mechanical toy should have. [2]
- (b) Using a material of your own choice, describe, with the aid of notes and sketches, each of the following processes. [6]
- (i) forming the body shape [6]
- (ii) making the head [6]
- (c) Design a hand-operated method for turning the spindle. [3]

17 Fig. 10 shows a design for a folding photo frame.

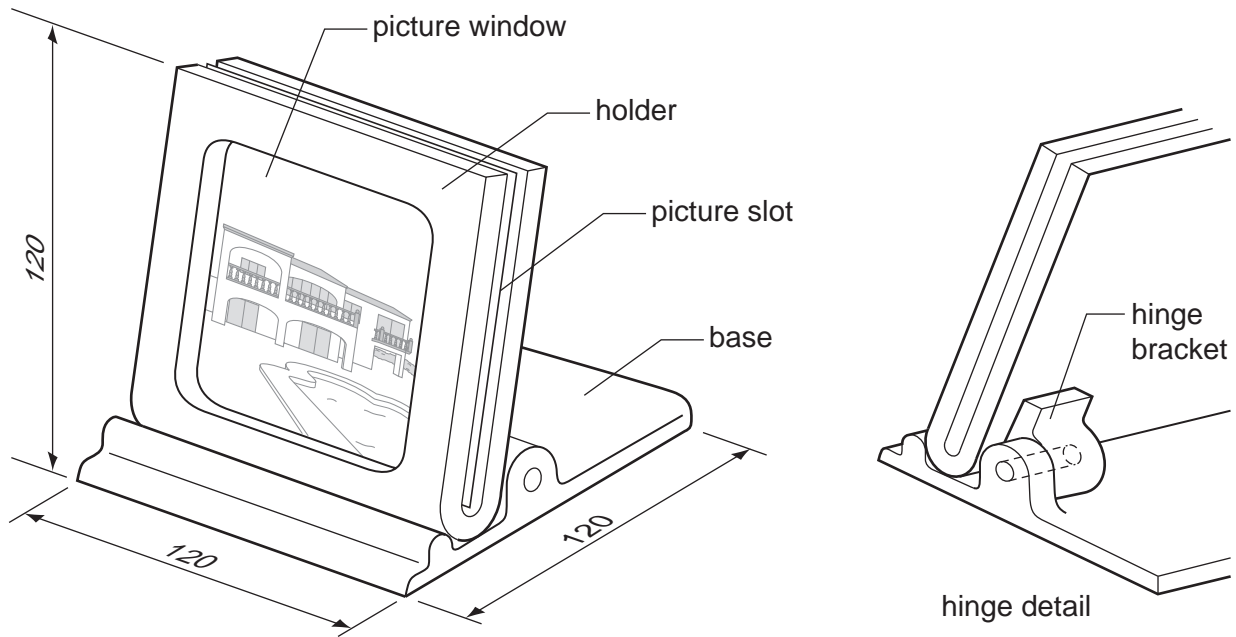


Fig. 10

- (a) State a material suitable for the photo frame and give a reason why it would be suitable. [2]
- (b) Using the material chosen in (a) and, with the aid of notes and sketches, explain how:
- (i) the picture window is cut and finished;
 - (ii) the holder is formed to create the picture slot before the hinge bracket is attached;
 - (iii) the base is produced. [15]

18 Fig. 11 shows details of a partition support.

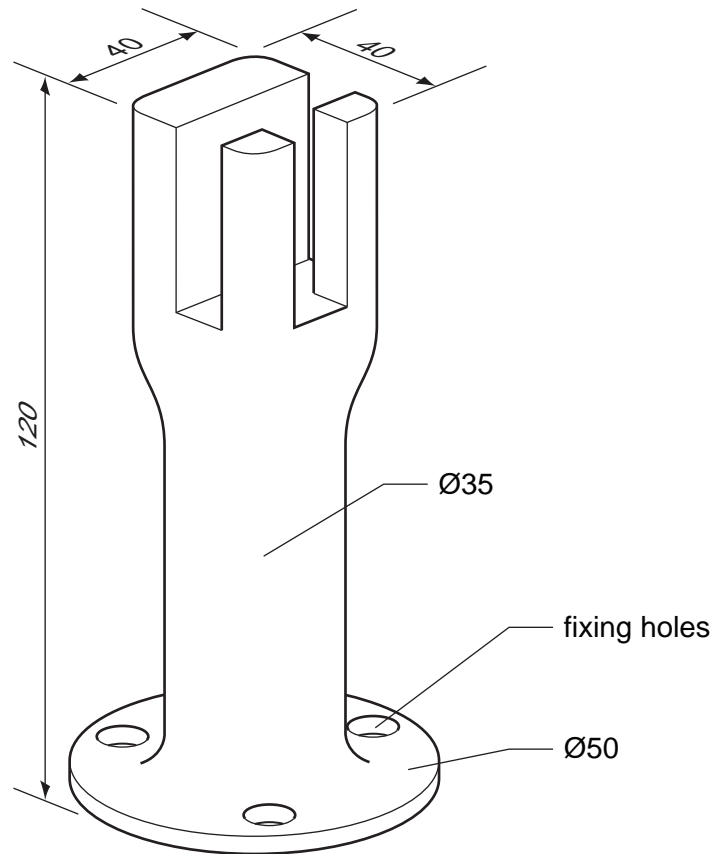


Fig. 11

- (a) Suggest **two** possible methods of production for the support and give **one** reason why each would be suitable. [4]
- (b) Choose **one** of the methods you suggested in (a) and, using notes and sketches, describe the **major** stages in making the support. Do **not** include the fixing holes. [10]
- (c) Explain, with the aid of sketches, how you would mark out the centres for the three equally spaced fixing holes. [3]

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