

DESIGN AND TECHNOLOGY

Paper 1 Technology

6043/01

October/November 2014

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 an HB pencil for any diagrams, graphs or rough working.

Do not use staples, paper-clips, 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 Sketch a folding bar and state its purpose. [3]
- 2 Fig. 1 shows a kitchen chopping board.

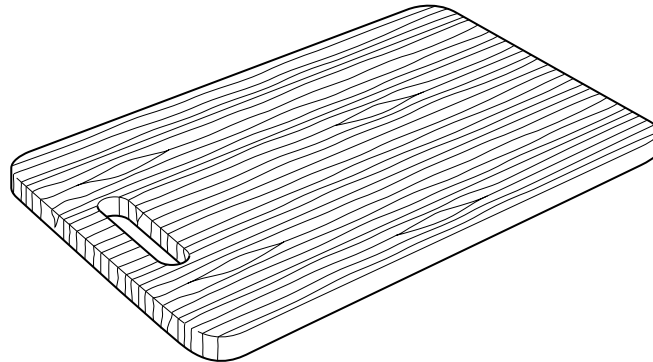


Fig. 1

Give **two** reasons why wood would be a suitable material for the board. [2]

- 3 Give the full names of the following plastics.

(a) P.V.C.

(b) G.R.P.

[2]

- 4 Fig. 2 shows a metalworking tool.

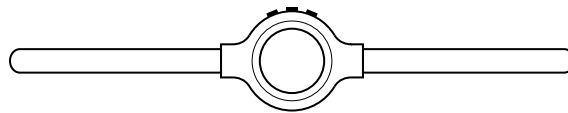


Fig. 2

(a) Name the tool. [1]

(b) Describe its use. [2]

- 5 Name **three** simple workshop tests that can be used to help identify a plastic material. [3]
- 6 Sketch **two** methods of joining wooden boards edge to edge as shown in Fig. 3.

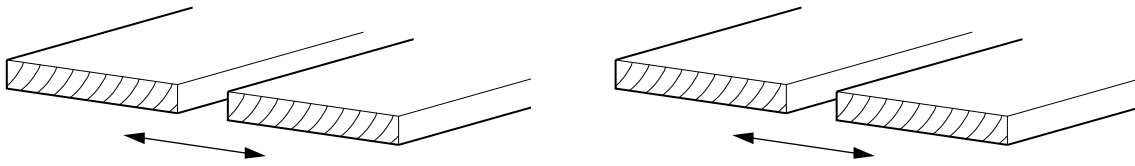


Fig. 3

- 7 Give **two** examples of how personal appearance and clothing can cause safety problems. [2]
- 8 Fig. 4 shows a dog feeding bowl made from plastic.

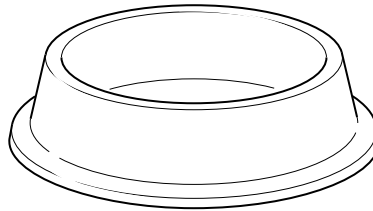


Fig. 4

- (a) Name a suitable method of production for such a bowl.
- (b) Give **two** reasons why plastic has been used for the feeding bowl. [3]
- 9 State **two** common faults or defects found in timber. [2]
- 10 Fig. 5 gives details of a copper strip ready for soldering to create a ring.

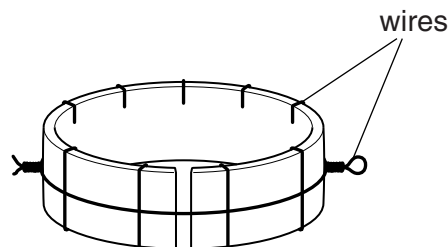


Fig. 5

- (a) State the purpose of the wires. [2]
- (b) State a suitable metal for the wires. [1]

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. 6 shows three different types of drilling device.

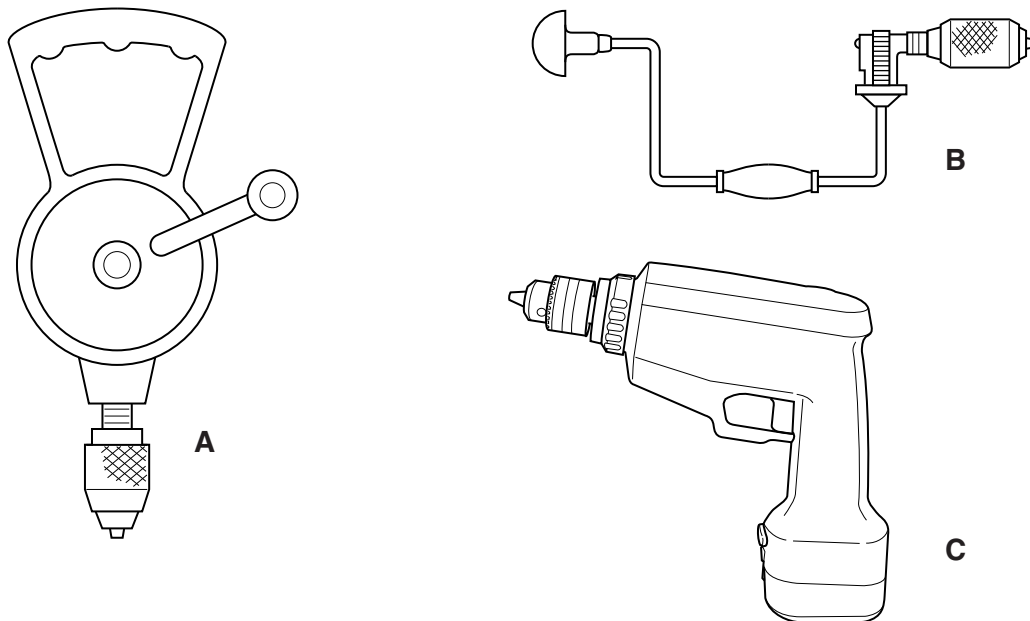


Fig. 6

- (a) Name each device, and for each, explain how the drill bit or boring tool is held and locked in the chuck. [9]
- (b) With the aid of notes and sketches, explain why:
- (i) device **A** has limited use in the workshop;
 - (ii) device **B** has a ratchet system;
 - (iii) device **C** is considered to be more versatile than the other two. [6]
- (c) Explain why friction can be a problem when using drilling bits or boring tools. [2]

12 One of the major considerations for a designer is choosing a suitable joining medium for materials.

(a) Copy the chart below and add the missing information.

| Joining situation | Joining medium to be used | Reasons for use |
|------------------------------|---------------------------|-----------------|
| Acrylic to Acrylic | | |
| Brass to Pine | | |
| Oak to Oak | | |
| Tinplate to Tinplate | | |
| Melamine to Blockboard | | |

[15]

(b) Give **two** examples of how poorly prepared surfaces can result in weak joints.

[2]

13 The design for a salad server is shown in Fig. 7.

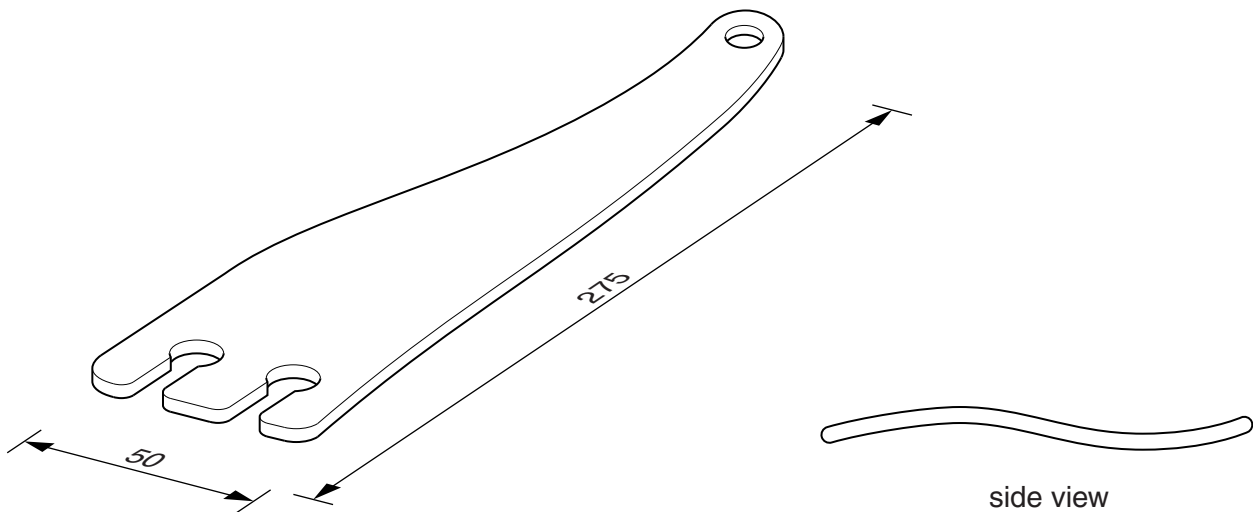


Fig. 7

(a) State **two** properties that would be useful in a material used to make the salad server shown in Fig. 7. [2]

(b) Some possible materials being considered are:

- (i) Acrylic;
- (ii) Beech;
- (iii) Copper.

For **each** material give **one** reason for selecting and **one** reason for rejecting it as a suitable material for the server. [6]

(c) Describe how heat or steam are used when forming the server for each of the materials in (b). [7]

(d) Explain why it would be difficult to cut to shape or drill the server after bending. [2]

Section 2 – Processes

14 Fig. 8 shows parts of a child's ride on toy.

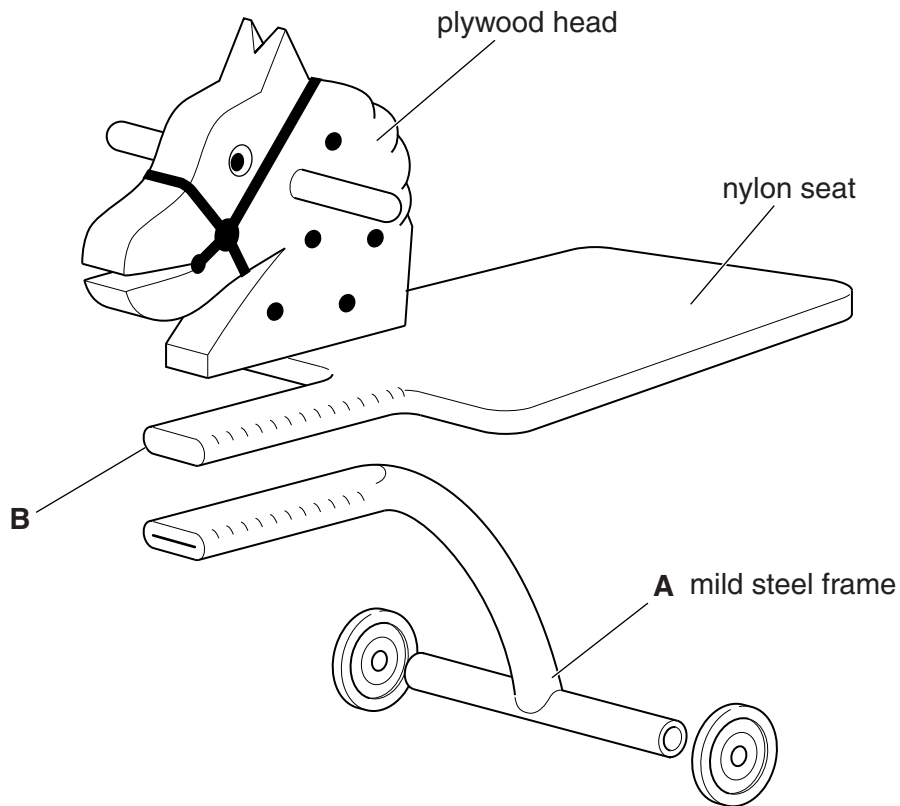


Fig. 8

- (a) State the safety factors that need to be considered when designing toys for young children. [3]
- (b) Choose **two** of the following processes and, using notes and sketches, describe how each is carried out.
- (i) Brazing the mild steel frame together at **A**.
 - (ii) Drilling and screwing the mild steel frame, nylon seat and plywood head together at **B**.
 - (iii) Cutting and finishing the plywood head. [14]

15 The design for a bathroom step to help elderly people is shown in Fig. 9.

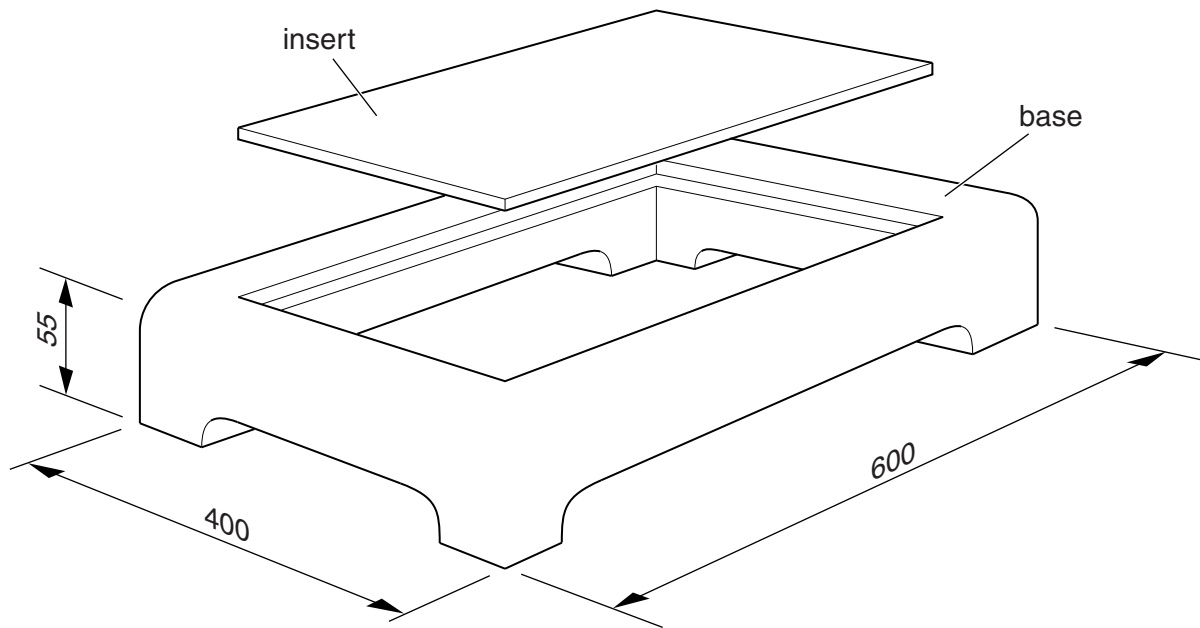


Fig. 9

- (a) State **two** important properties that the step aid shown in Fig. 9 should have in addition to a non-slip surface. [2]
- (b) Using materials of your own choice, use notes and sketches to describe how the step base could be made:
- (i) from a number of parts;
 - (ii) as one piece without joints. [12]
- (c) With the aid of sketches, show how the step insert could be improved to prevent elderly people from slipping. [3]

16 Details of a simple game are shown in Fig. 10.

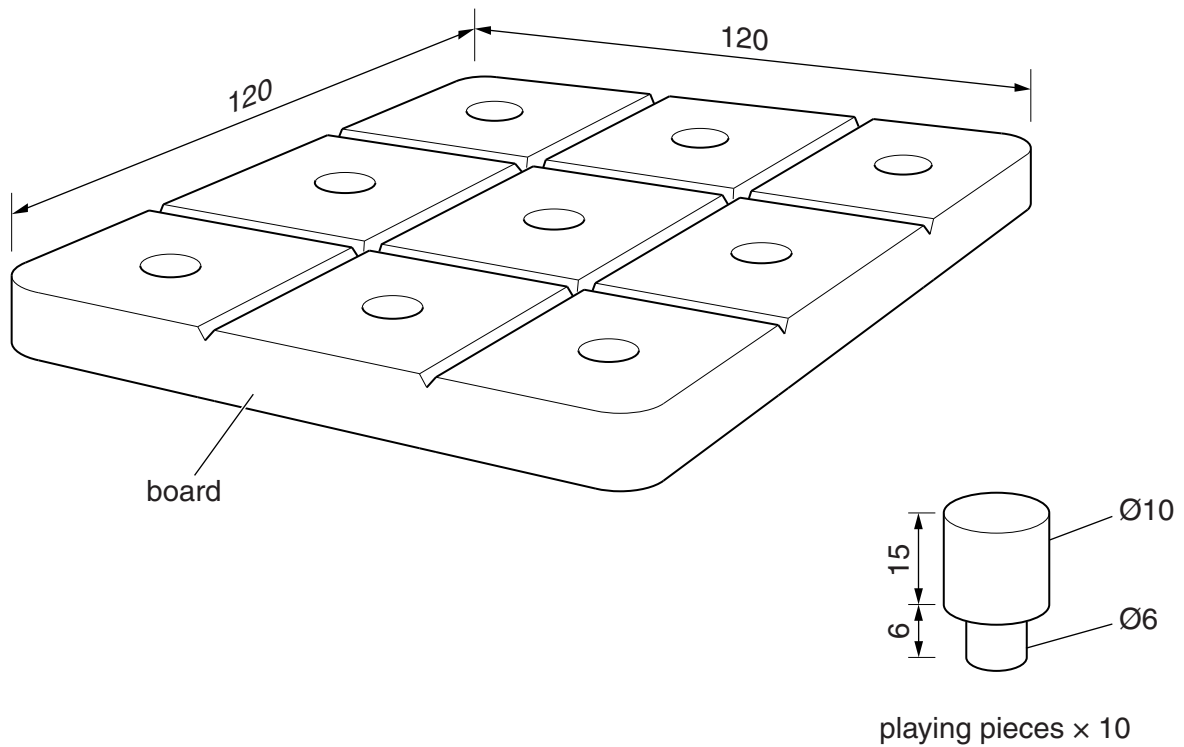


Fig. 10

- (a) Explain how the playing pieces with this game could prove a danger to small children. [2]
- (b) Using materials of your own choice, describe, using notes and sketches how the:
- (i) board could be made;
 - (ii) playing pieces could be made.
- [12]
- (c) With the aid of notes and sketches, explain how the playing pieces could be designed to show two differing sets. [3]

17 The design for a napkin ring is shown in Fig. 11.

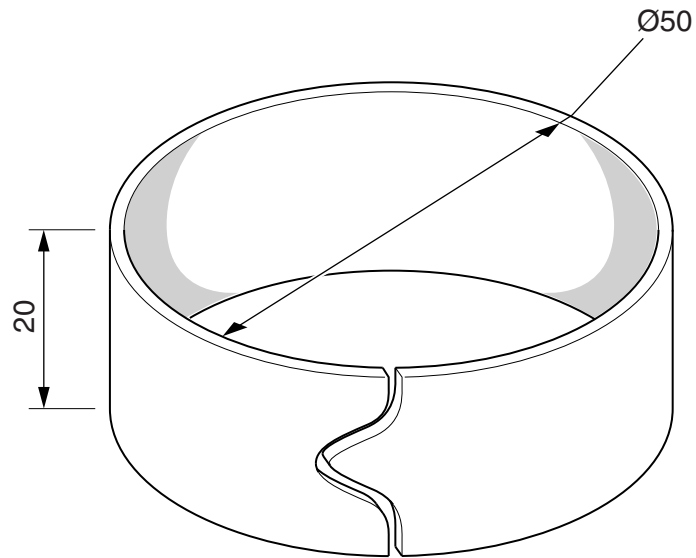


Fig. 11

- (a) Suggest **two** possible sheet materials suitable for the ring shown in Fig. 11 and give reasons for your choice. [4]
- (b) Using notes and sketches, explain in detail how the ring could be made using one of the materials given in (a). [7]
- (c) Sketch **two** ideas for a holder to store four rings. [6]

18 Fig. 12 shows an angle plate used in self assembly shelving.

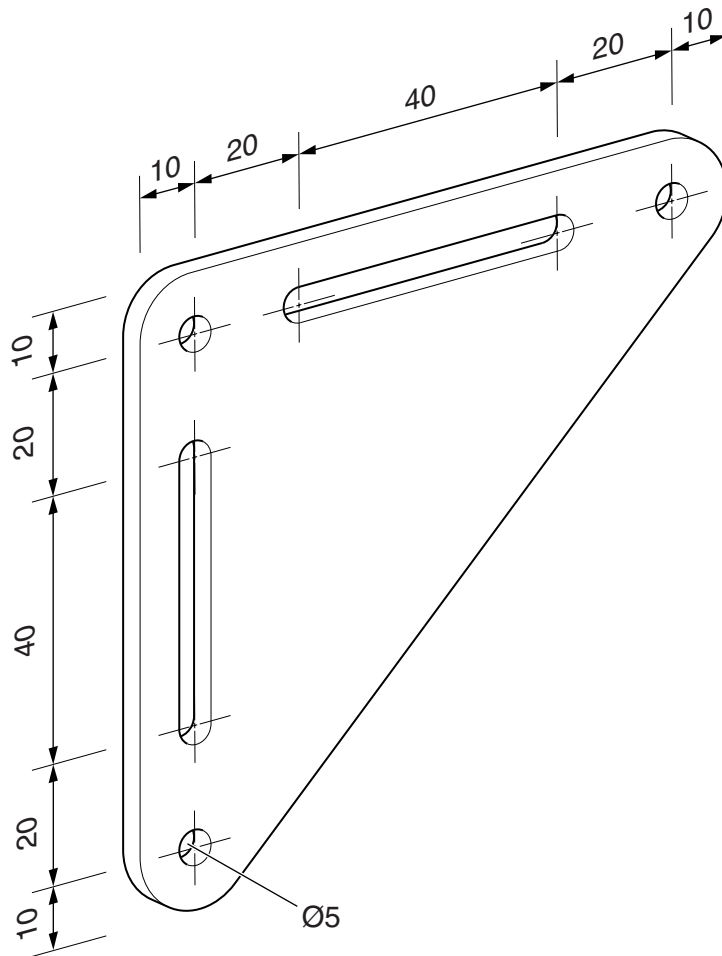


Fig. 12

- (a) Suggest a suitable material for the angle plate and give **two** reasons for your choice. [3]
- (b) Using the material chosen in (a), describe, using notes and sketches how to:
- (i) mark out the plate;
 - (ii) make one slot;
 - (iii) cut and finish the outside shape. [12]
- (c) Explain why slots are useful when assembling shelving. [2]

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