



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

DESIGN AND TECHNOLOGY

6043/01

Paper 1 Technology

October/November 2013

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 **12** printed pages.



Part A

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

Attempt **all** questions.

- 1 When tempering tool steel, what do oxide colours indicate? [2]
- 2 Sketch a bradawl and explain its purpose. [3]
- 3 Fig. 1 shows a small plastic measuring scoop used in cooking.

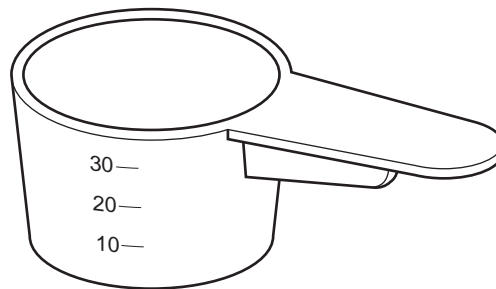


Fig. 1

- (a) State a suitable method of manufacture. [1]
 - (b) State why the plastic needs to be heated. [1]
- 4 Fig. 2 shows two metal boxes that are used in a workshop process.

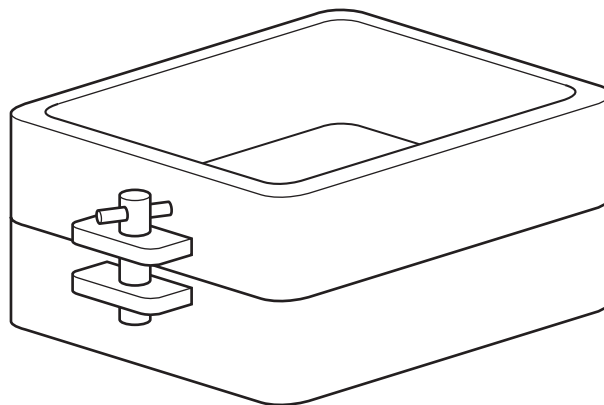


Fig. 2

- (a) Name the two boxes. [2]
 - (b) State their purpose. [2]

- 5 With the aid of sketches, show **three** different ways of fixing the plywood bottom of a desk drawer as shown in Fig. 3.

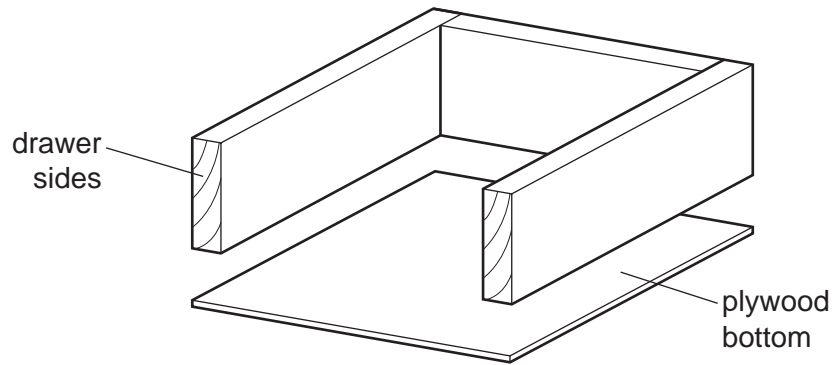


Fig. 3

[3]

- 6 Fig. 4 shows two pieces of acrylic about to be joined.

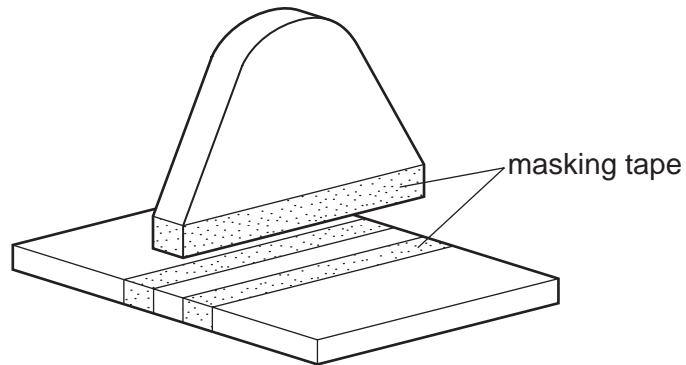
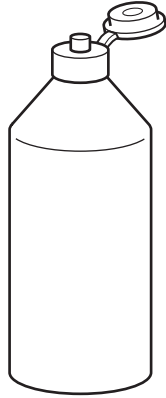


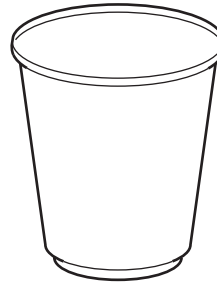
Fig. 4

- (a) Name the type of bonding agent that would be used. [1]
- (b) State why masking tape is used around the joint. [1]
- 7 (a) Explain briefly the term *forging* when used in the workshop. [2]
- (b) Identify **one** possible hazard when forging. [1]
- 8 State **two** different wood finishes. [2]
- 9 For each of the following protective items, state a different workshop process where it would be required.
- face mask
 - rubber gloves
- [2]

10 Fig. 5 shows two plastic products.



a squeeze bottle



a hot drinks cup

Fig. 5

- (a) State a suitable plastic for the manufacture of each product. [2]
- (b) Give a reason for the choice of each plastic. [2]

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 Accurate measurement is a vital part of construction work.

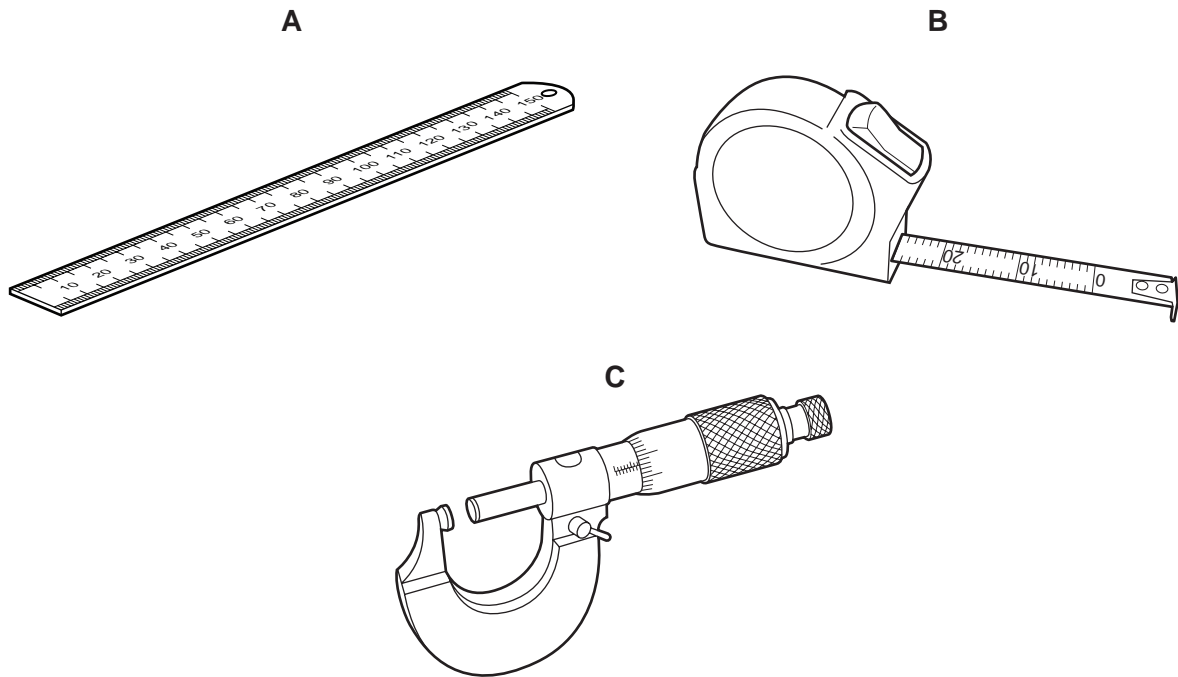


Fig. 6

- (a) Identify each of the measuring tools shown in Fig. 6 and explain the purpose of each. [6]
- (b) Using notes and sketches show:
- (i) how a pair of odd-leg callipers could be set to a measurement using tool **A**;
 - (ii) the advantage tool **B** has over other measuring tools;
 - (iii) a turned bar being checked for size using tool **C**. [9]
- (c) With the aid of a sketch, show how a twist drill with no measurements showing may be checked for size. [2]

12 The situation in which a material is to be used plays an important role in its selection.

(a) Explain the effect of:

- (i)** very hot weather on a softwood bench;
- (ii)** dripping water on mild steel;
- (iii)** a hot candle flame close to an acrylic holder.

[6]

(b) Using examples, explain how the shaping of each material can be helped by:

- (i)** steam on wood;
- (ii)** heat on metal;
- (iii)** air on plastic.

[6]

(c) With the aid of examples, explain what effect the processing of some materials can have on our working environment. [5]

13 Fig. 7 shows three different fixings used when joining materials.

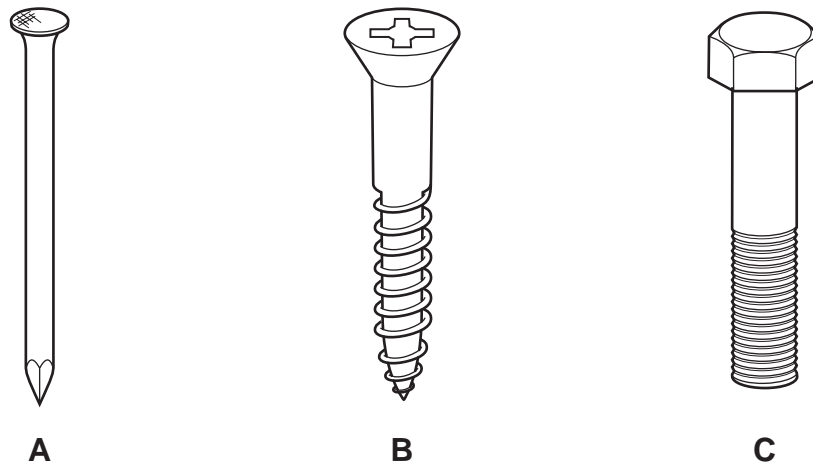


Fig. 7

- (a) Name the **three** fixings shown in Fig. 7 and give a use for each. [6]
- (b) Each fixing named in (a) requires a different type of tool to complete the joining process.
Sketch an appropriate tool for each fixing. [9]
- (c) Using an example, explain why different materials are sometimes used for fixings. [2]

Section 2 - Processes

14 The outline design of a child's wooden toy is shown in Fig. 8.

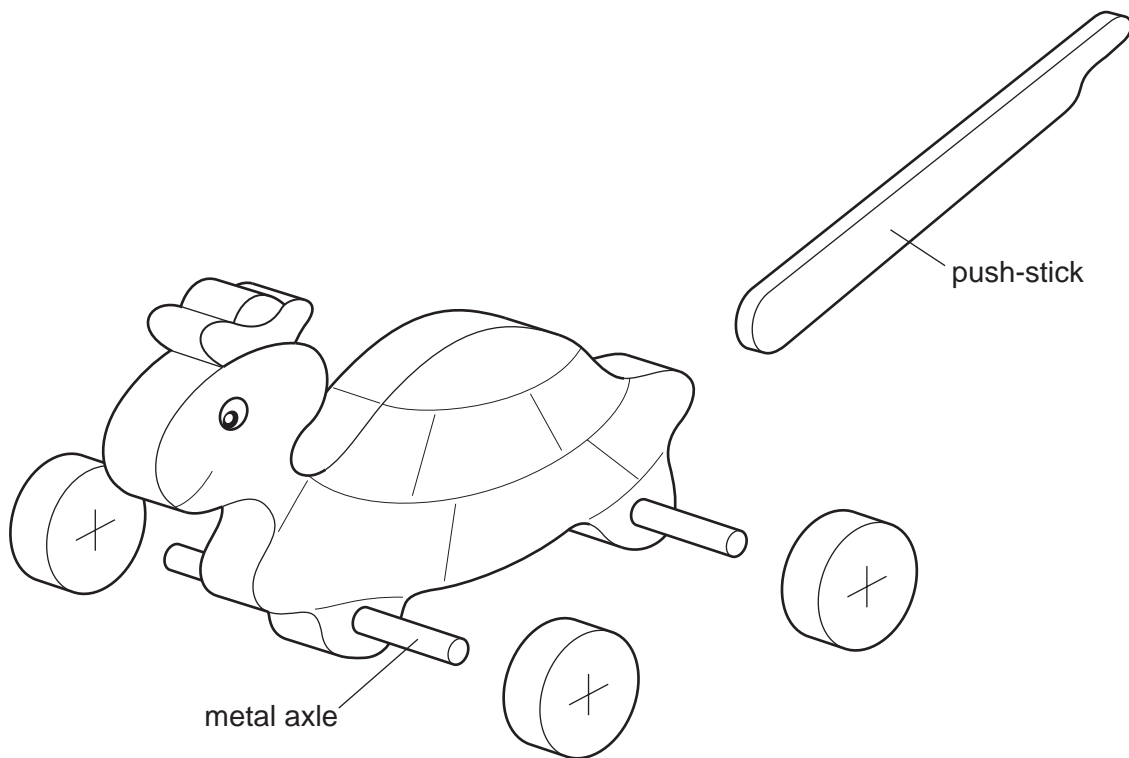


Fig. 8

- (a) Give **two** safety factors that should be considered when designing toys for young children. [2]
- (b) The metal axle shown in Fig. 8 is fixed and cannot rotate.
- (i) State a method of joining the wheels to the axle so that they can rotate but not become detached. [3]
- (ii) Using notes and sketches, describe the processes needed to make the wheels and axle. [4]
- (c) Describe the various stages of preparing and painting the toy. [5]
- (d) With the aid of a sketch, show how the push-stick may be easily attached to or detached from the toy. [3]

15 Fig. 9 shows details of a paper napkin holder that could be made by:

- casting;
- vacuum forming;
- injection moulding;
- building up from pieces.

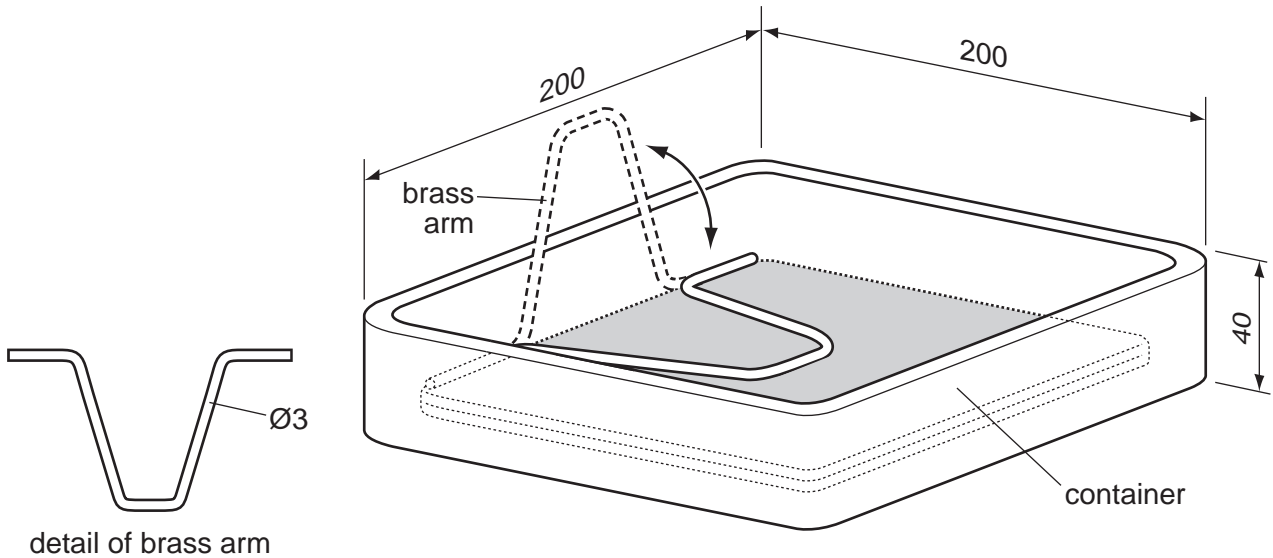


Fig. 9

- (a) For **two** of the listed processes, state an advantage and disadvantage of each. [4]
- (b) For **one** of the listed processes, use notes and sketches to describe how the container would be made. [8]
- (c) Describe, with the aid of notes and sketches, how the arm may be formed and fixed to the container. [5]

16 Details of a table-cover clip are shown in Fig. 10.

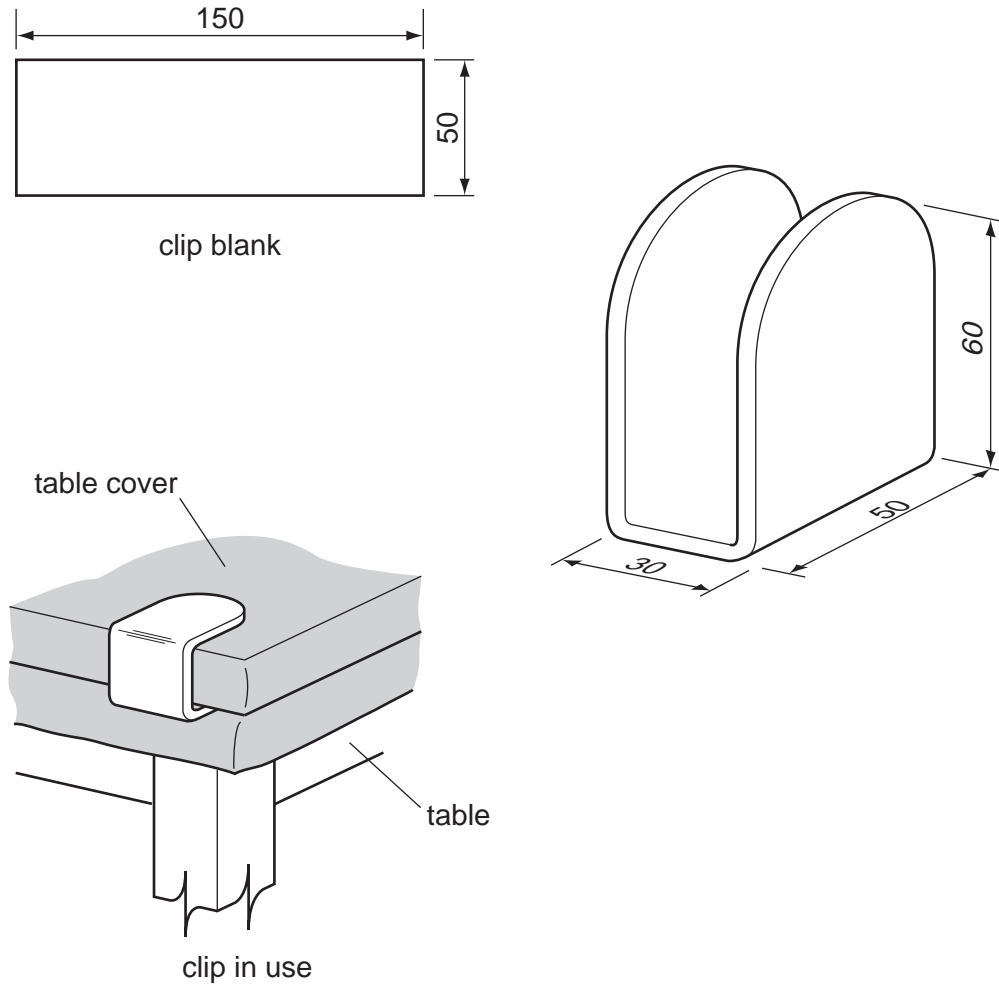


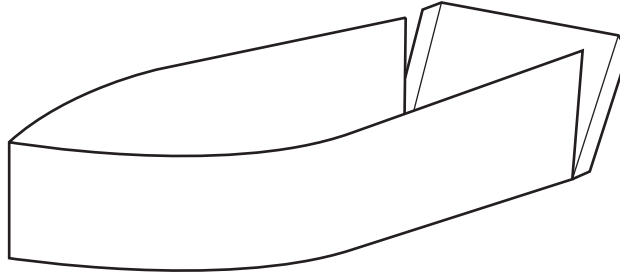
Fig. 10

- (a) Suggest a suitable sheet material for the cover clip and give a reason for your choice. [2]
- (b) Using the material chosen in (a), describe, with the aid of notes and sketches:
- (i) marking out the blank ready for cutting and forming; [5]
 - (ii) cutting and finishing the outline shape; [5]
 - (iii) forming the clip shape. [5]

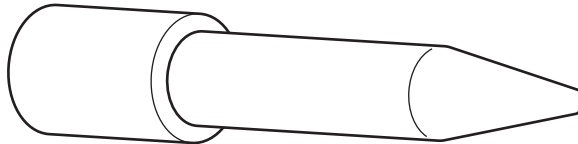
17 Fig. 11 shows three products that are made using different processes.

Select **two** of the processes and describe how each of the processes is carried out in the making of the product shown.

- Soft soldering the joints on a tinfoil boat.



- Turning a wooden tent peg on the lathe.



- Blow moulding a soap dish.

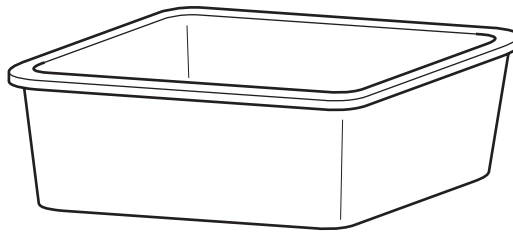


Fig. 11

[17]

18 Using notes and sketches to support your answers, explain what is meant by **each** of the following terms.

- Fluidising.
- Case hardening.
- Lamination.
- Extrusion.

[17]

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included the publisher will be pleased to make amends at the earliest possible opportunity.

University of Cambridge International Examinations is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.