



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

DESIGN AND TECHNOLOGY

6043/01

Paper 1 Technology

October/November 2010

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 Sketch the **two** parts of a mortice and tenon joint. [4]
- 2 Fig. 1 shows two parts of a brass marking out template. [4]

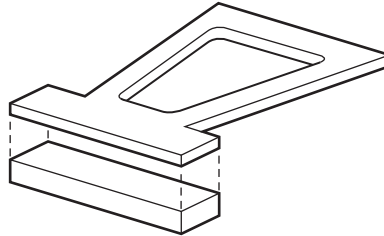


Fig. 1

State **two** methods of joining the pieces together. [3]

- 3 Which process would be used to produce the plastic sections shown in Fig. 2?

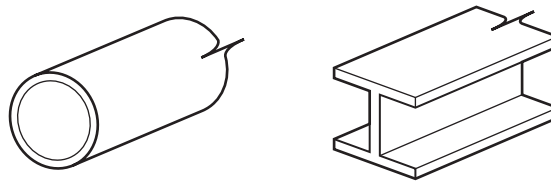


Fig. 2

- 4 Explain the term 'anthropometric data' when applied to design work. [2]
- 5 An outline design for a wooden rocking horse is shown in Fig. 3. Give **three** safety features that the rocking horse should have. [2]

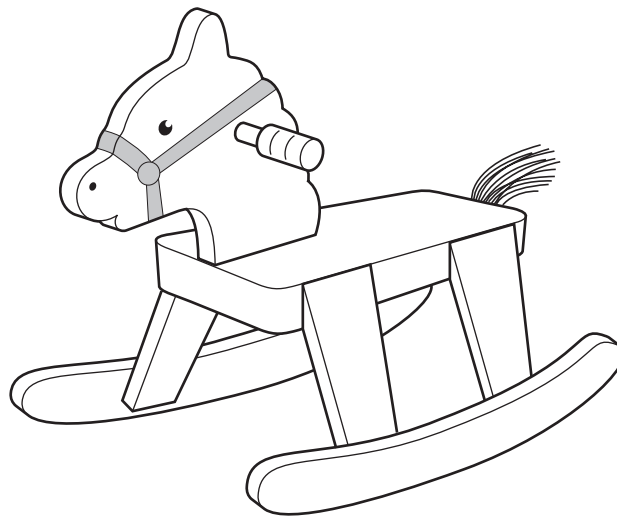


Fig. 3

[3]

6 Name the **two** items shown in Fig.4.

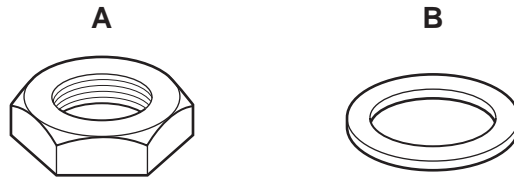


Fig. 4

[2]

7 State **two** ways in which acrylic may be heated prior to bending. [2]

8 Study Fig. 5 and explain why the plane would cut well if used as in **A**, but tear the wood if used as in **B**.

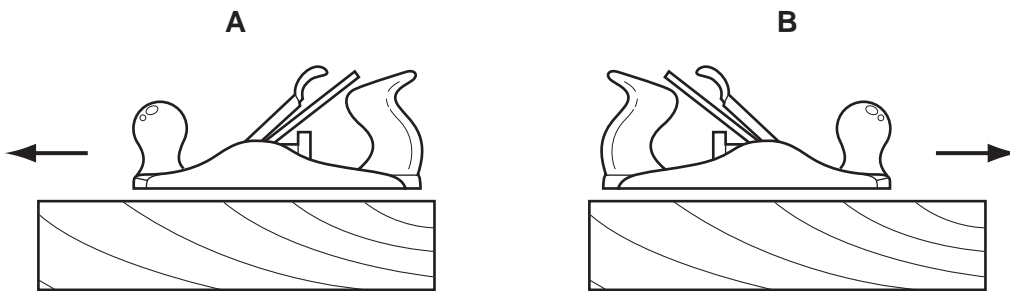


Fig. 5

[2]

9 Sketch **two** ways in which cut edges on sheet metal can be made safe. [4]

10 Fig. 6 shows a food bag clip that is made from plastic.

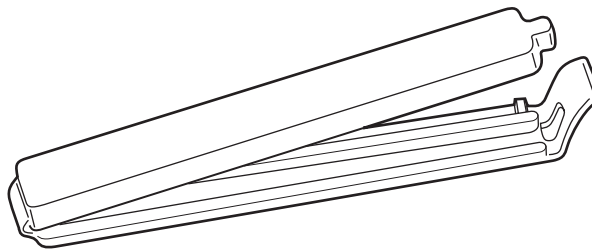


Fig. 6

(a) Why has plastic been used?

(b) Which process would have been used to mass produce the clip? [3]

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. 7 shows three different types of saw.

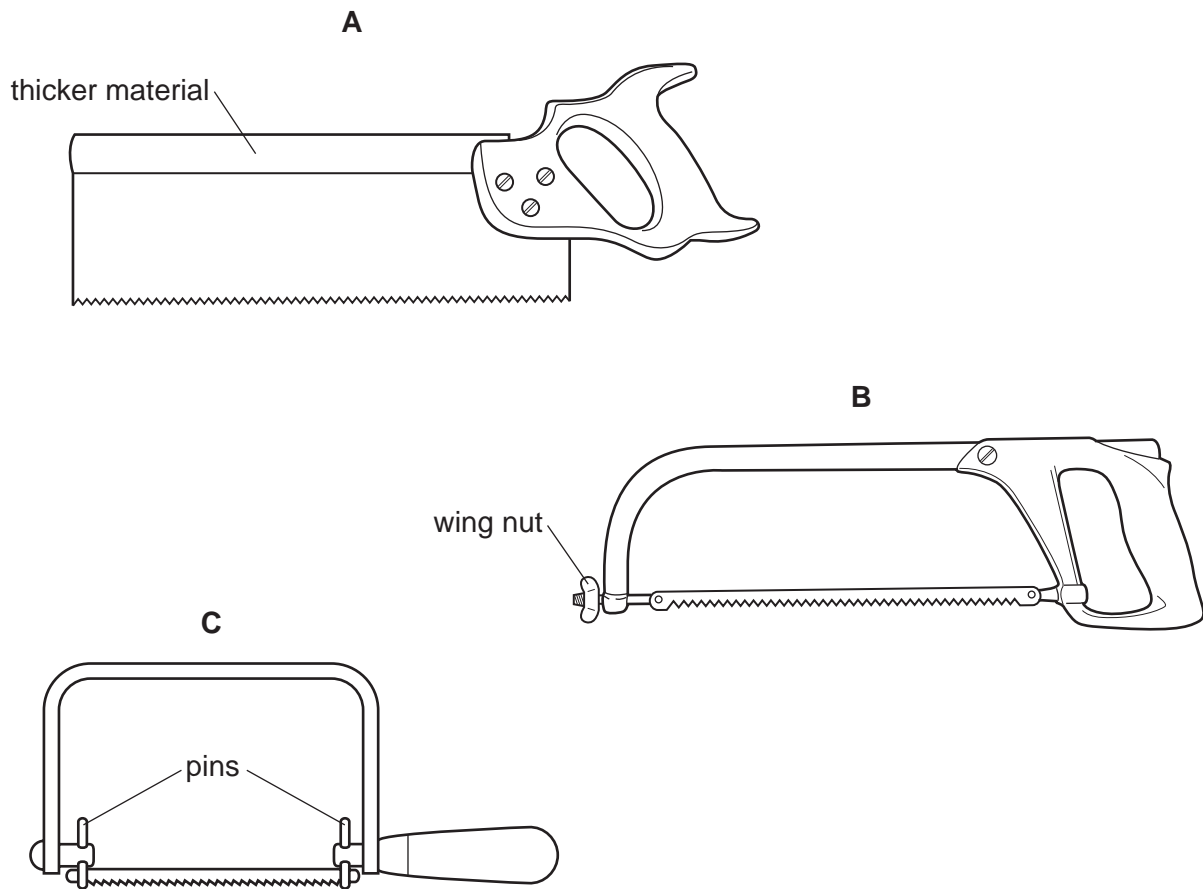


Fig. 7

- (a) Identify each saw shown in Fig. 7 and give an example of its use. [6]
- (b) Explain the reason for:
- (i) the thicker material on tool A;
 - (ii) the wing nut at the end of tool B;
 - (iii) the two small pins on tool C. [6]
- (c) Sketch **one** other type of saw and explain its purpose. [5]

12 Many workshop processes have an element of danger so special clothes or equipment are used for protection.

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

Practical task	The main danger involved	Special clothes or equipment needed
Turning hardwood on a lathe		
Laying up a mould with G.R.P.		
Cleaning copper in an acid bath		
Cutting sheet polystyrene with a hot wire cutter		
Casting molten aluminium		

[15]

(b) Explain why any dust produced when working materials in a workshop can be a hazard. [2]

13 Materials are available in many different forms.

(a) State a use for each of the following materials and explain why they are suitable for that use.

(i) M.D.F. board

(ii) mild steel tube

(iii) expanded polystyrene foam [9]

(b) Explain why the following material forms have been used for the purpose given.

(i) chipboard sheeting for mass produced furniture

(ii) P.V.C. (polyvinylchloride) for clothing and upholstery

(iii) copper wire for electrical cables [6]

(c) Give **two** reasons why some materials are worked in a liquid state. [2]

Section 2 - Processes

14 Parts of a target used in a ring throwing game are shown in Fig. 8.

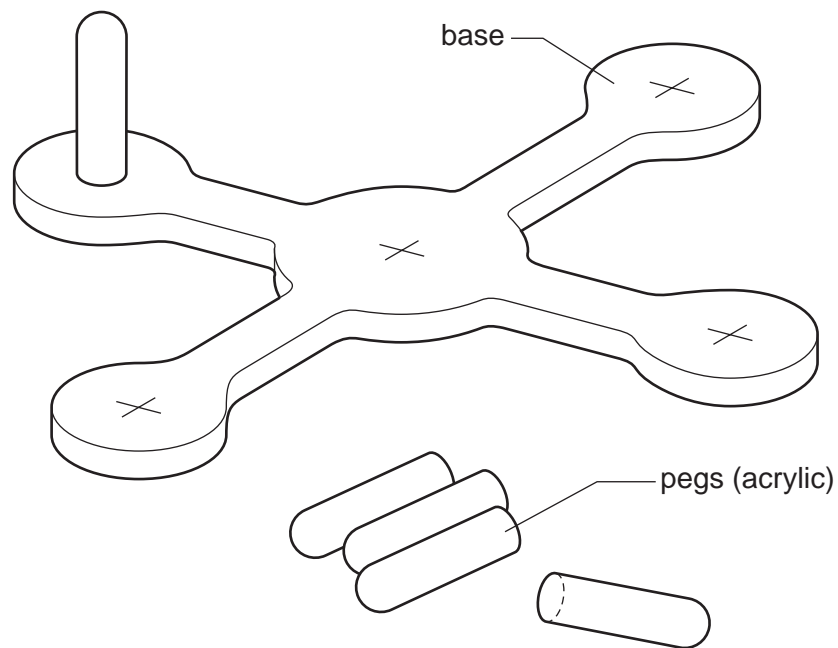


Fig. 8

(a) Some possible materials are under consideration for the base.

- (i) aluminium
- (ii) birch plywood
- (iii) nylon

Give **one** reason for selecting and **one** reason for rejecting each material [6]

(b) Choose **one** of the materials named in part (a).
Show, using notes and sketches:

- (i) how the base may be produced; [7]
- (ii) **two** ways the pegs may be located and fixed to the base. [4]

15 The outline design for a salad server is shown in Fig. 9.

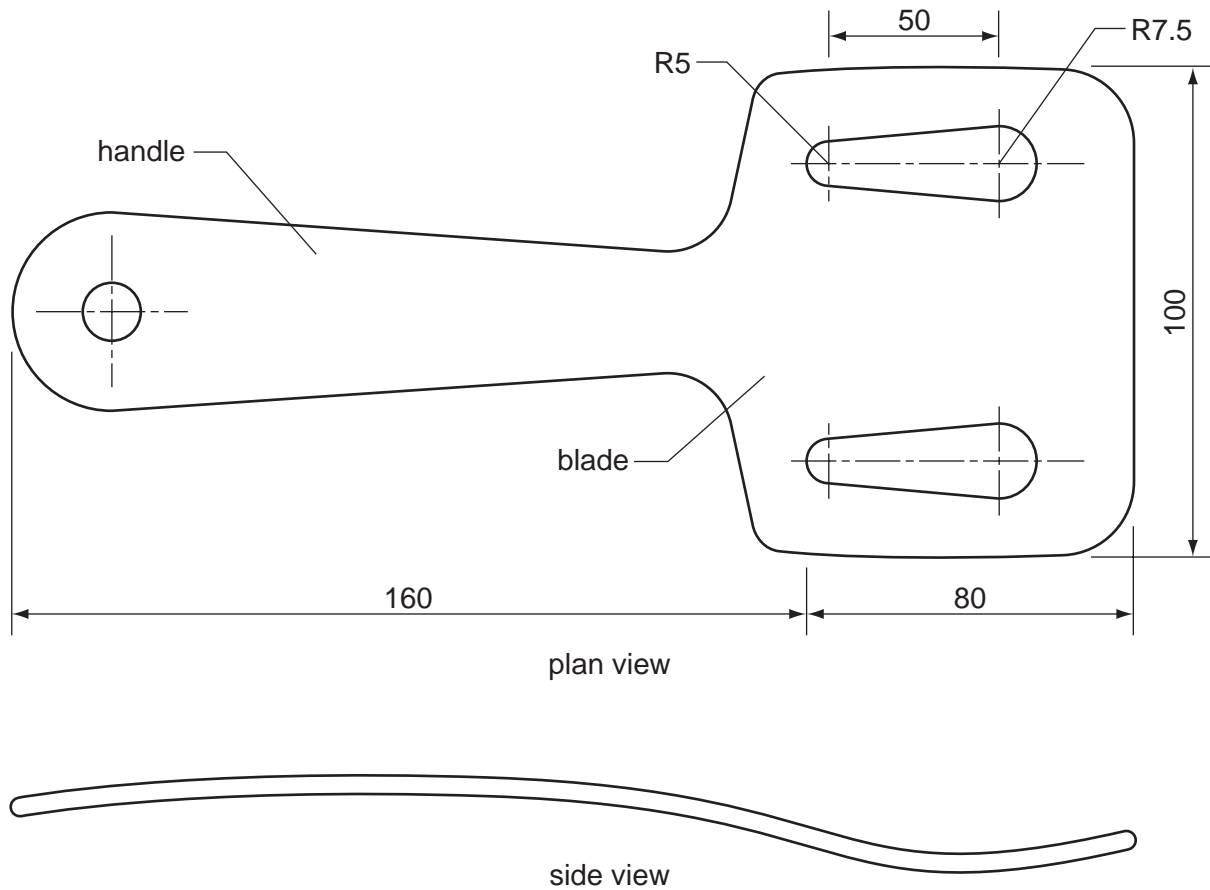


Fig. 9

- (a) Choose a material for the server and give **two** reasons 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 slotted holes are made in the blade;
 - (ii) the outline is cut to shape and finished. Give details of all tools and equipment used. [10]
- (c) Explain how the server is formed to the shape of the side view. [5]

16 A wind chime is shown in Fig. 10.

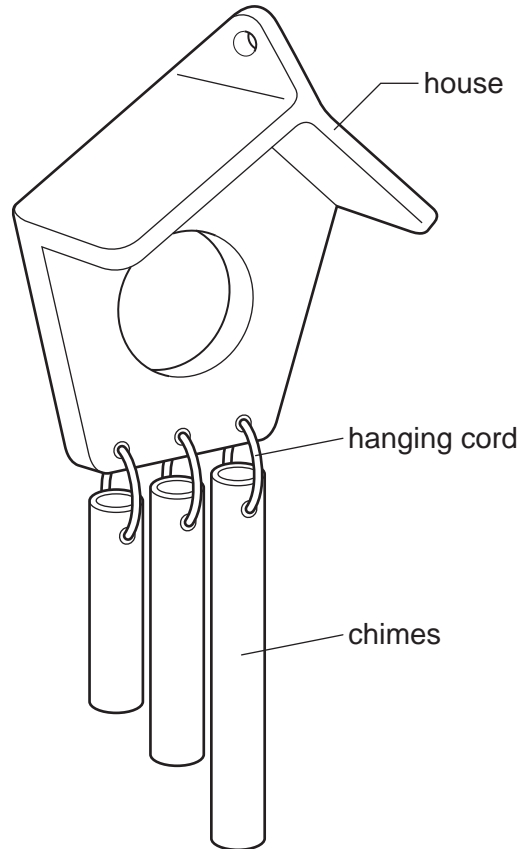


Fig. 10

- (a) Give **one** reason why each of the following materials has been chosen for parts of the wind chime.
- (i) hanging cord – nylon
 - (ii) chimes – copper [2]
- (b) Describe, with the aid of notes and sketches, how the house part could be made by **two** of the following processes.
- (i) injection moulding
 - (ii) built up from separate pieces
 - (iii) casting [15]

17 A mobile coat rail is shown in Fig. 11.

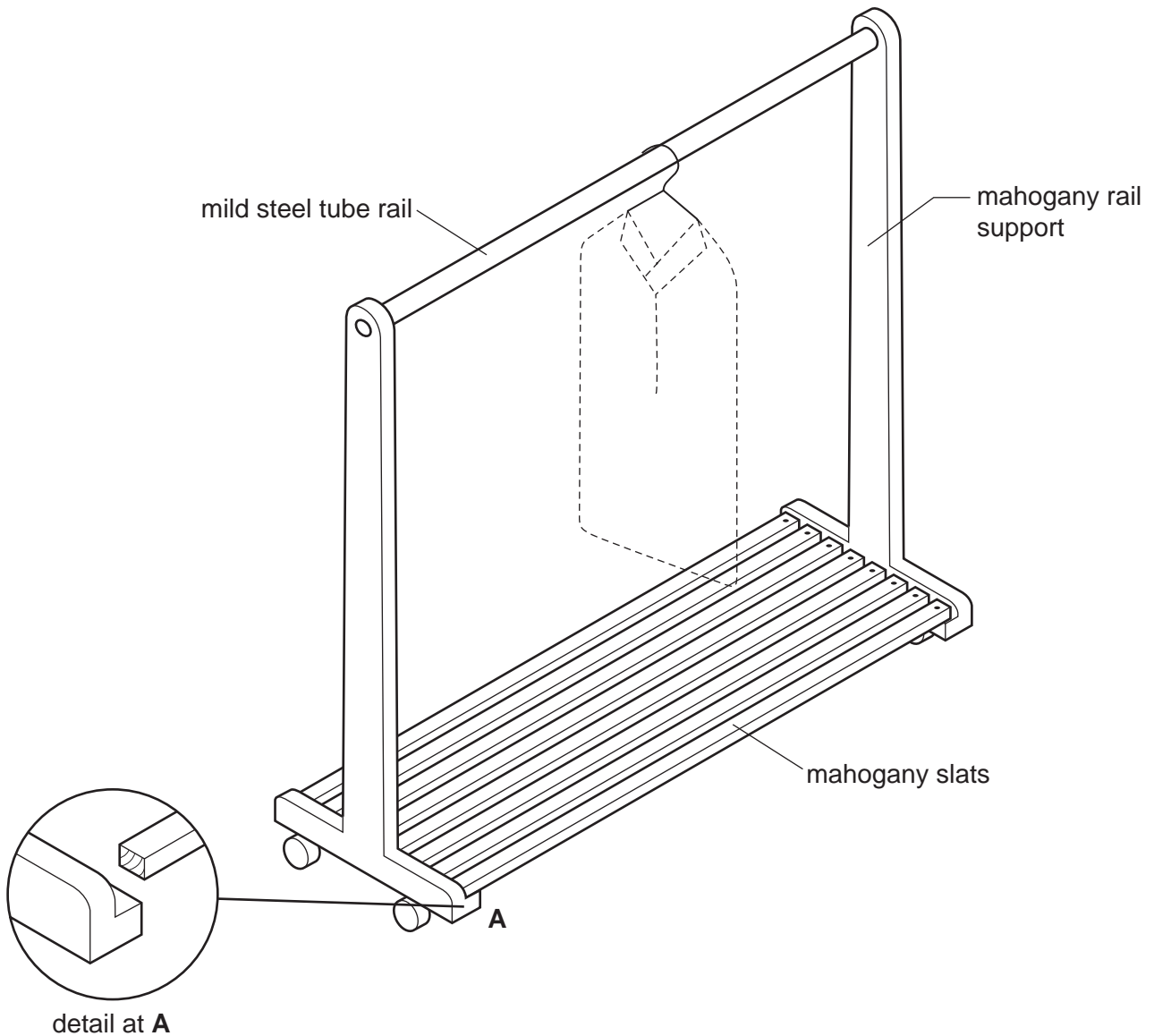


Fig. 11

(a) Give a reason for using each of the following materials for the coat rail.

- (i) mild steel tube for the rail
- (ii) mahogany for the rail support
- (iii) polyurethane lacquer to coat the mahogany

[6]

(b) Describe, with the aid of sketches and notes, **two** of the following processes.

- (i) boring a hole in the mahogany supports to locate the rail
- (ii) screwing the mahogany slats to the supports
- (iii) lacquering the mahogany supports and slats

[11]

18 The outline design for a wind direction indicator is shown in Fig. 12.

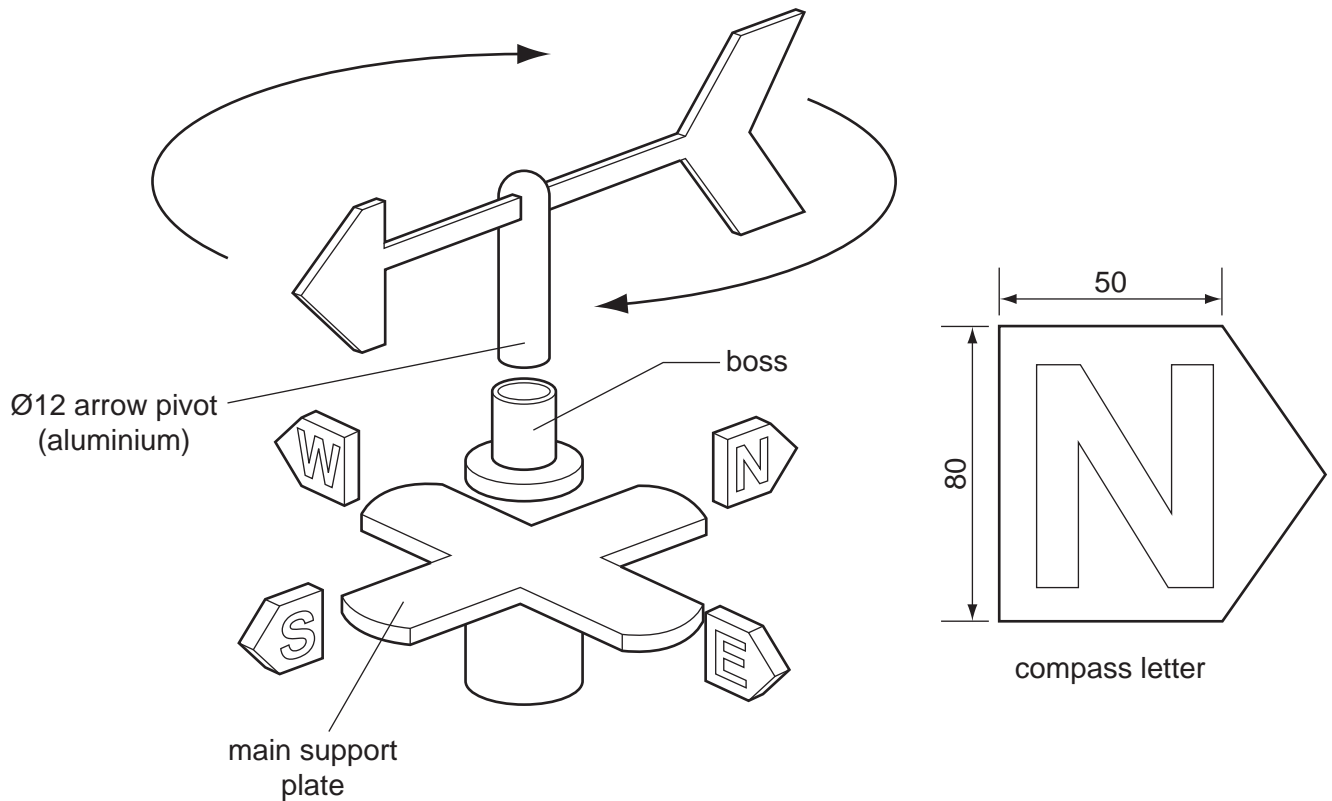


Fig. 12

- (a) Give **three** important features required of the indicator for it to work properly. [3]
- (b) The support plate and letters could be made from each of the following materials.
- marine plywood
 - brass
 - acrylic
- (i) For each of the materials, describe a different method of creating the compass letters. [6]
- (ii) Using **one** of the materials in part (i), explain how the compass letters would be joined to the main support plate. [3]
- (c) The boss is to be made from a piece of Ø25 nylon rod. Describe how this would be turned on the lathe. [5]

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