

CAMBRIDGE INTERNATIONAL EXAMINATIONS
Joint Examination for the School Certificate
and General Certificate of Education Ordinary Level

DESIGN AND TECHNOLOGY

6043/1

PAPER 1 Technology

OCTOBER/NOVEMBER SESSION 2002

2 hours 30 minutes

Additional materials:
Answer paper
Plain paper
Sketching equipment

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.

Part A

Answer **all** questions.

Part B

Answer **four** questions.

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

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 unless otherwise stated.

Use sketches where appropriate to help answer any questions.

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

This question paper consists of 10 printed pages and 2 blank pages.



Part A

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

Attempt **all** questions.

1 Name a suitable metal for:

(a) water pipes;

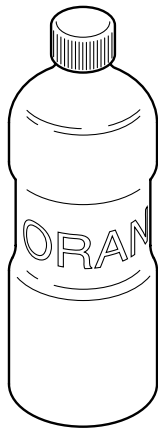
(b) chisel blades.

[2]

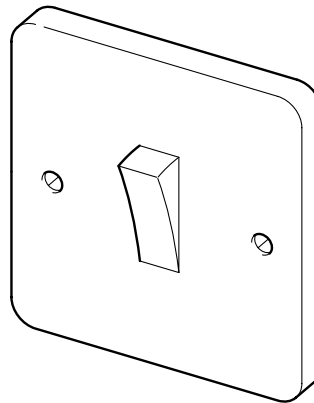
2 Give the full name of the material commonly referred to as M.D.F.

[2]

3 Fig. 1 shows two everyday items made of plastic, name a process by which each could be made.



(a) drinks bottle



(b) light switch

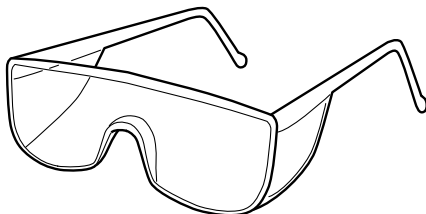
[2]

Fig. 1

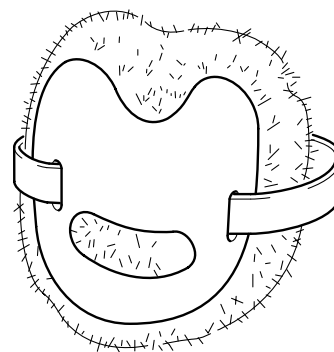
4 Sketch a woodworker's sash cramp and explain how it is used.

[4]

5 Identify the two protective devices shown in Fig. 2 and give a reason for the use of each.



(a)



(b)

[4]

Fig. 2

- 6 Give **three** reasons why 'research' is carried out when starting on a design problem. [3]
- 7 Name a marking out tool suitable for marking:
- (a) a line parallel to a true edge on metal;
 - (b) double lines parallel to a true edge on wood;
 - (c) a scratched circle or arc on plastics. [3]
- 8 State **three** forms in which plastics are supplied. [3]
- 9 Fig. 3 shows a metal bar that has been forged to shape. Explain the term 'to forge'.

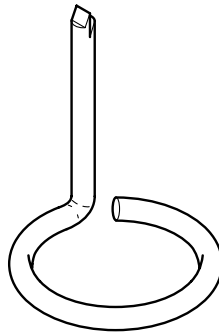


Fig. 3

- 10 Name **two** different types of abrasive used when finishing the surface of a material. [2]

Part B

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

Answer **four** questions in all,
one from Section 1,
two from Section 2 **and**
one further question from either section.

All questions carry equal marks.

Section 1 – Tools and Material

11 Three different cutting tools are shown in Fig 4.

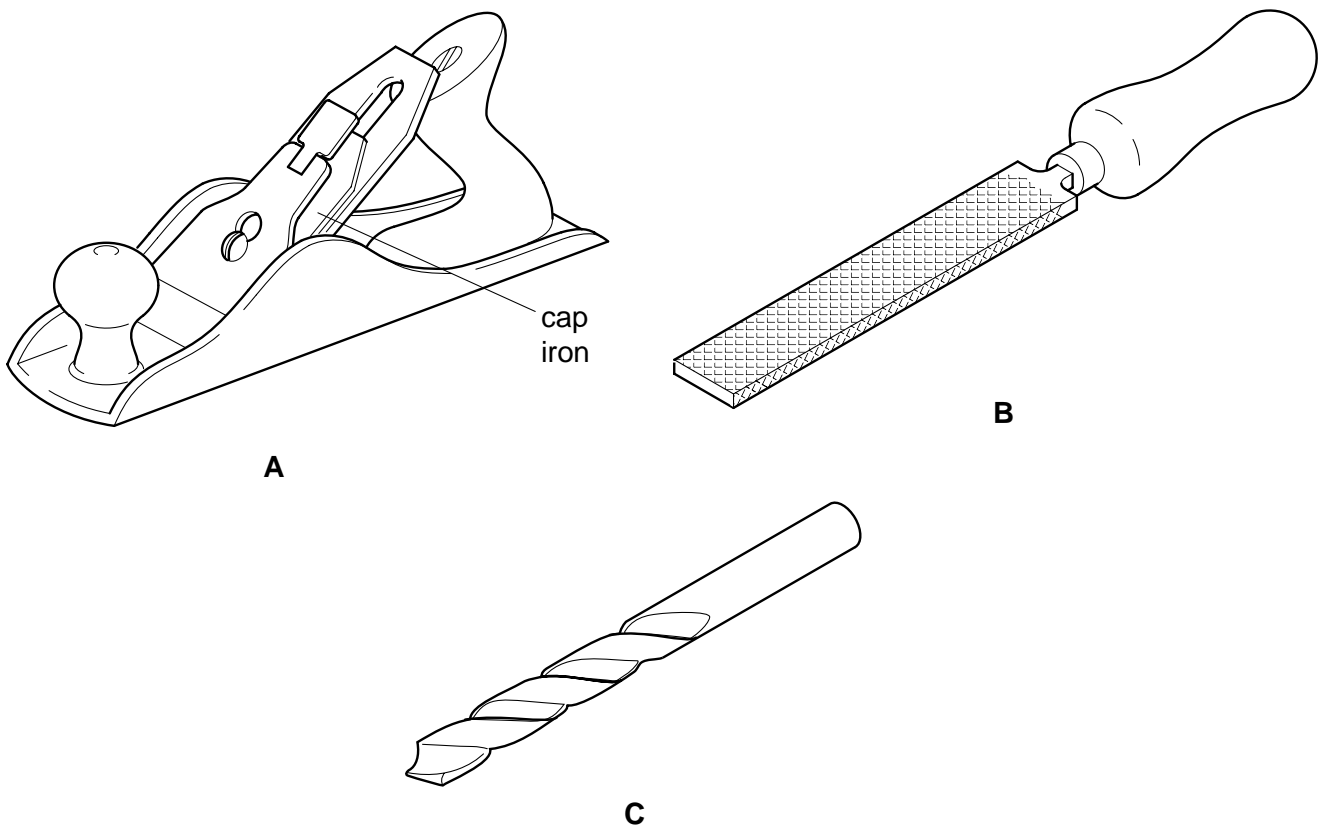


Fig. 4

- (a) Identify each of the three cutting tools and explain the purpose of each. [6]
- (b) Explain:
- (i) why the blade of tool **A** is used with a cap iron;
 - (ii) why tool **B** sometimes has chalk applied to the blade;
 - (iii) why tool **C** is sometimes used with a cutting fluid. [9]
- (c) Work to be cut by the three tools needs holding in some way, explain the reason for this. [2]

12 Materials can be joined together in many different ways.

(a) Name a specific permanent method of joining:

- (i) acrylic sheet to acrylic sheet;
- (ii) pine boarding to a pine frame;
- (iii) mild steel sheet to a mild steel bar.

[3]

(b) Sketch **three** different types of temporary joining methods and, for each, give a reason for their use. [9]

(c) Identify **two** tools used to apply turning force to temporary fixings and, explain how each tool works. [5]

13 The development and final design for a pair of food tongs is shown in Fig. 5.

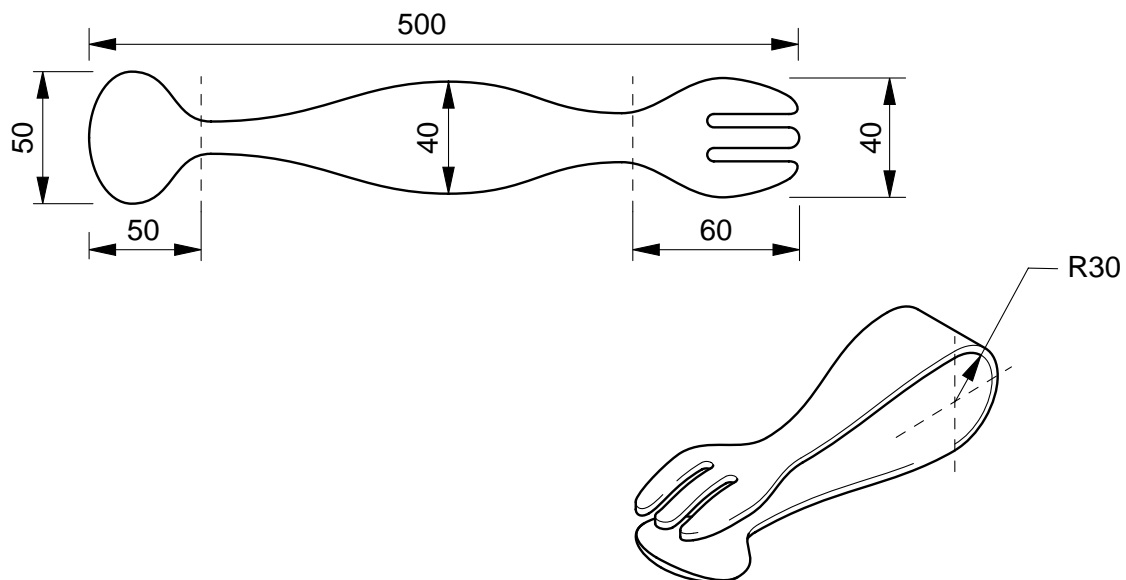


Fig. 5

(a) State **two** properties that would be useful in a material used to make this product. [2]

(b) Explain why the following materials would be unsuitable for the product.

- (i) thin plywood;
- (ii) mild steel sheet;
- (iii) expanded polystyrene.

[6]

(c) State a material that would be suitable to make the tongs and sketch **two** tools or pieces of equipment that will be needed to help form the radius 30. [7]

(d) Explain how you would provide a safe and suitable finished edge to the material. [2]

Section 2 – Processes

14 Fig. 6 gives details of a simple balance for use by children.

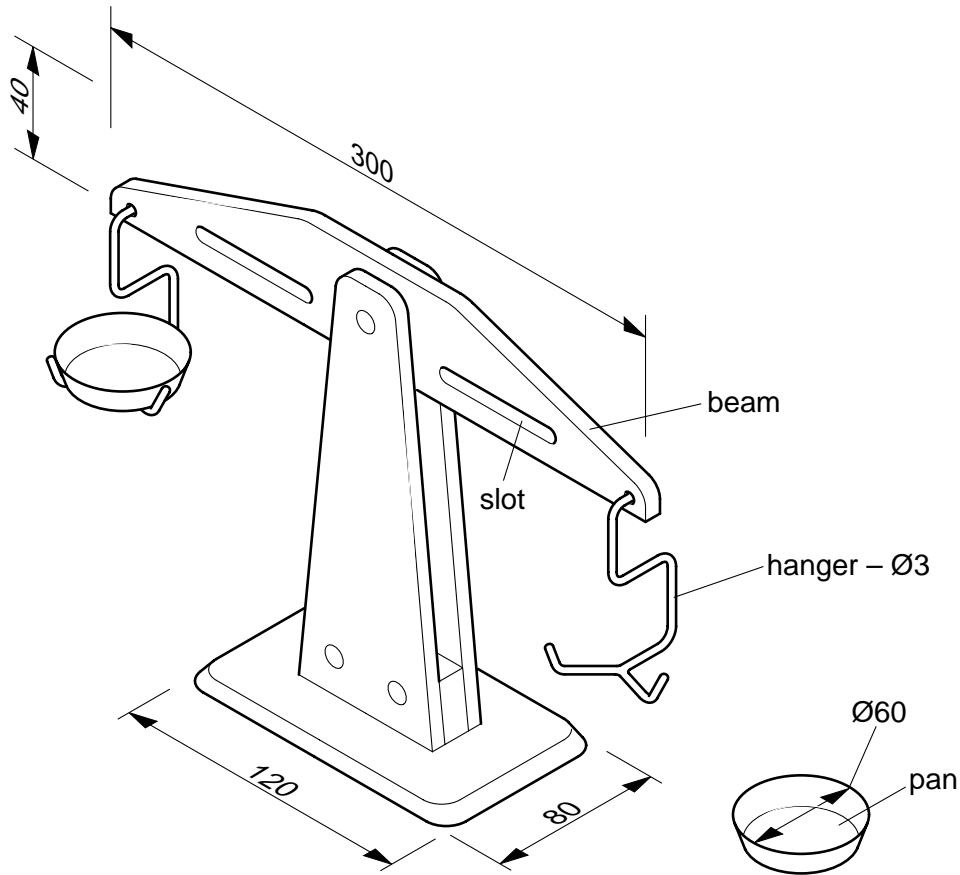


Fig. 6

(a) Choose a suitable material for each of the following parts and give your reason for its selection:

(i) the pan;

(ii) the hanger;

(iii) the beam.

[6]

(b) For the materials you specified in answer to (a), describe with the aid of notes and sketches how **one** of the following could be made.

The pan;
or the hanger;
or the beam.

[8]

(c) Show by means of a sketch how adjustable weights could be added to the slots to balance the beam before weighing begins.

[3]

15 The outline details of a sports changing room unit are shown in Fig. 7.

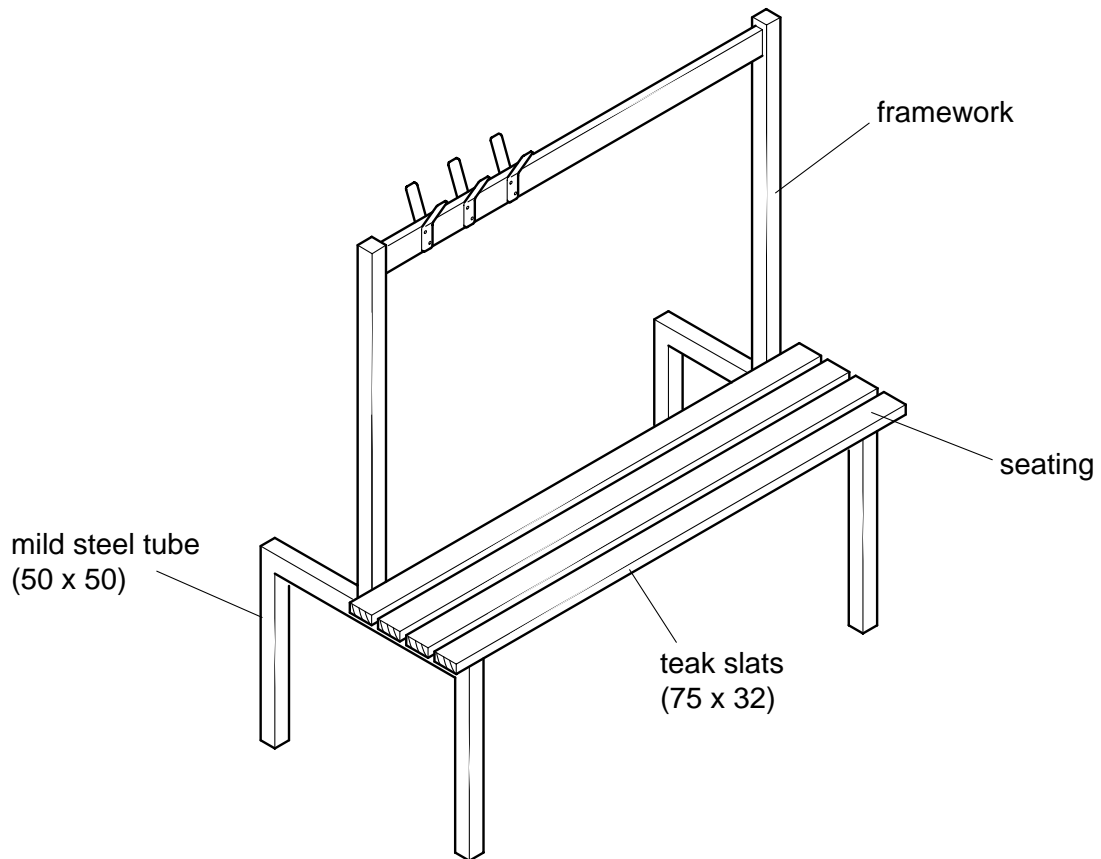


Fig. 7

(a) Explain a reason for using each of the following materials for the unit:

- (i) mild steel tube for the framework;
- (ii) teak for the seating slats;
- (iii) acrylic paint to coat the framework.

[6]

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

- (i) brazing a joint for the mild steel framework;
- (ii) screwing the teak slats to the mild steel framework;
- (iii) painting the mild steel framework.

[11]

16 Fig. 8 gives outline details of a guard rail support.

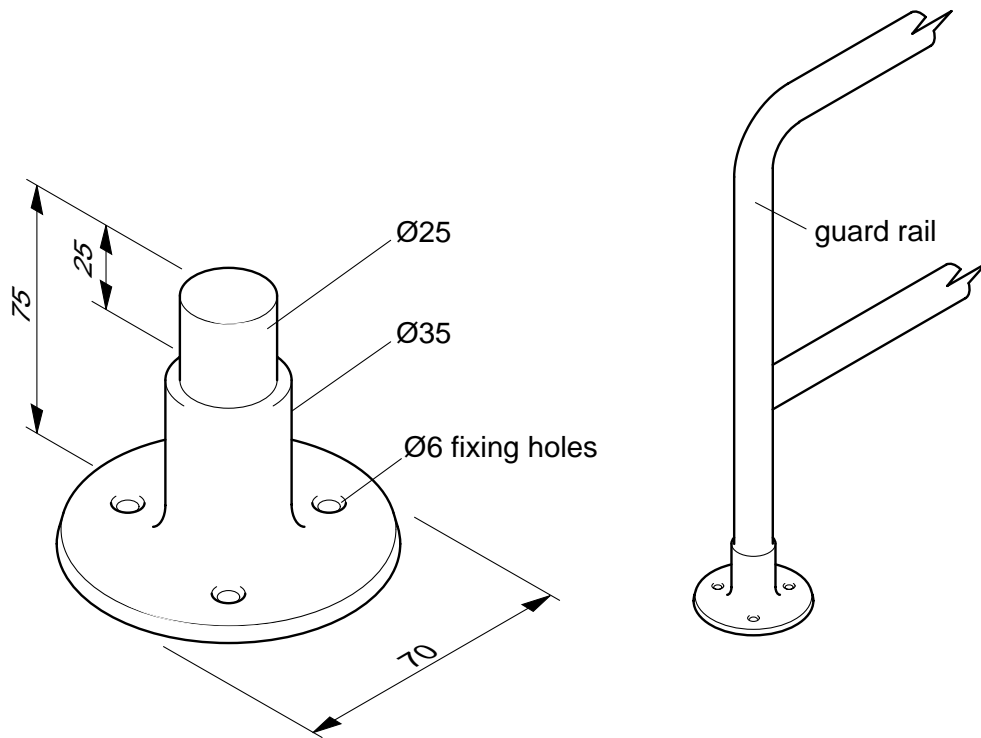


Fig. 8

(a) Suggest, **with a reason**;

(i) a suitable material for the guard rail support;

(ii) a method of manufacture.

[4]

(b) For the method of manufacture you suggested in answer to (a), use notes and sketches to describe the **major** stages in making the guard rail 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 fixing holes to ensure equal spacing.

[3]

17 The outline design for a tool tray that fits onto a step ladder is shown in Fig. 9.

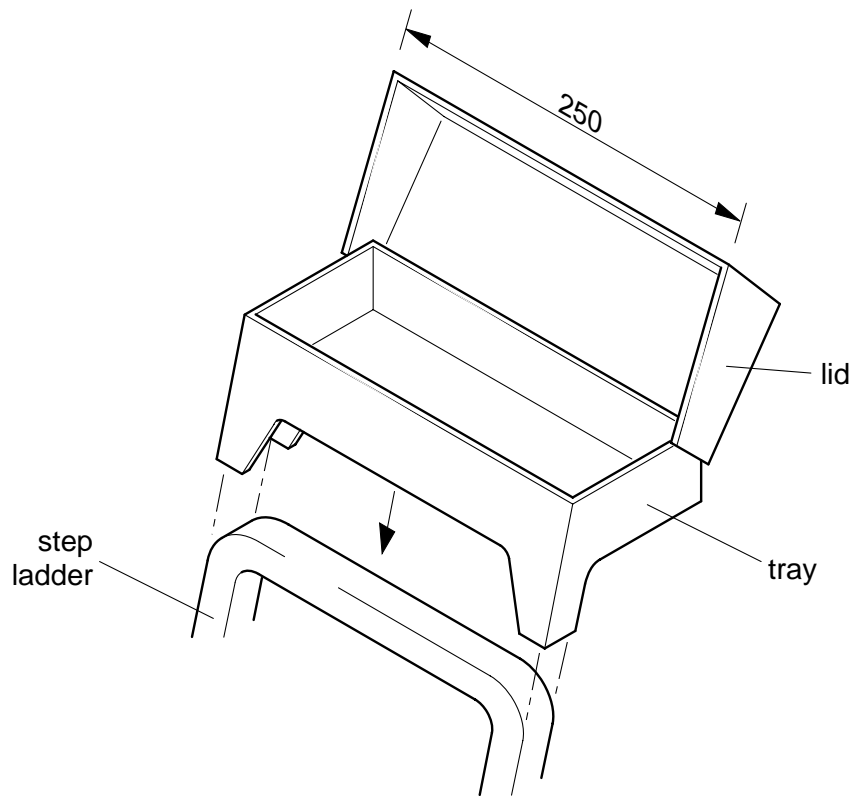


Fig. 9

- (a) Suggest a suitable material for the tray and lid and give a reason for your choice. [2]
- (b) Using notes and sketches, describe how the tray could be made from the material you have chosen in (a). [8]
- (c) Show, by means of an enlarged sketch, details of how the lid may be joined to the tray. [3]
- (d) Show by means of design sketches how the tray could be modified to hold tools and other items more effectively. [4]

- 18 Fig. 10 shows an idea for a 'hand paddle' to be used by handicapped people to develop movement skills.

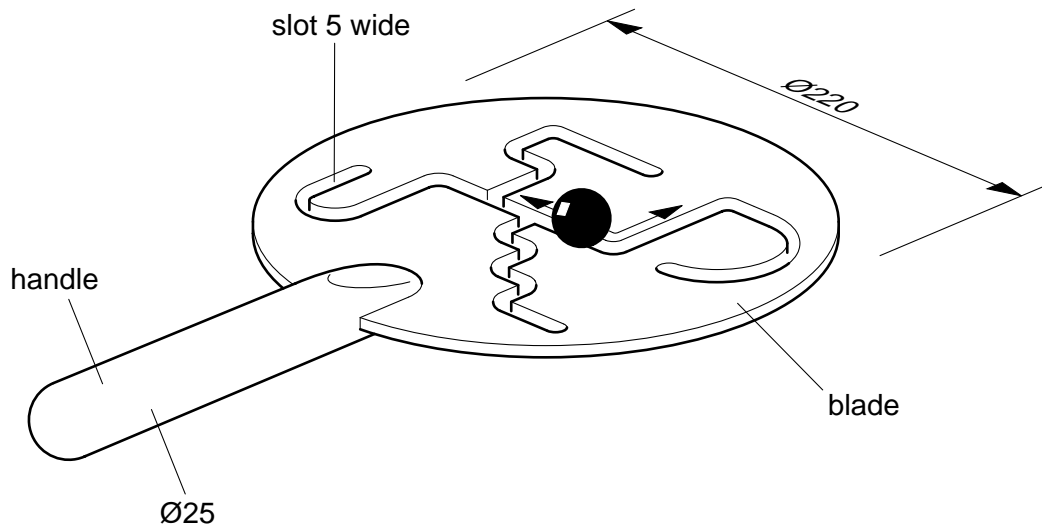


Fig. 10

- (a) Give **two** properties that a material should have to be suitable for the hand paddle. [2]
- (b) Suggest a suitable material for:
- (i) the handle;
 - (ii) the blade.
- Give your reason for each. [4]
- (c) Using notes and sketches describe the stages of:
- (i) producing the slots in the blade (include methods of holding work); [6]
 - (ii) joining the handle to the blade. [5]

