

**GENERAL CERTIFICATE OF SECONDARY EDUCATION**  
**DESIGN AND TECHNOLOGY**

**1959/03**

Industrial Technology  
Paper 3 (Foundation Tier)

Candidates answer on the Question Paper

**OCR Supplied Materials:**

None

**Other Materials Required:**

None

**Tuesday 22 June 2010**  
**Morning**

**Duration: 1 hour**

Candidate Forename		Candidate Surname	
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Centre Number						Candidate Number				
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**INSTRUCTIONS TO CANDIDATES**


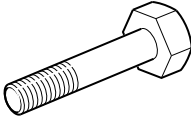

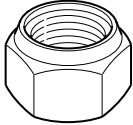
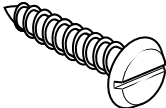
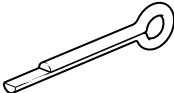
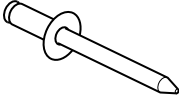
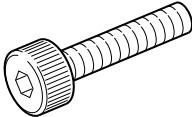
- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your Candidate Number, Centre Number and question number(s).

**INFORMATION FOR CANDIDATES**

- The number of marks is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this paper is **50**.
- All dimensions are in millimetres.
- Assume any mechanical system to be 100% efficient.
- This document consists of **12** pages. Any blank pages are indicated.

1 The table below shows some standard components used to fix metal parts together.

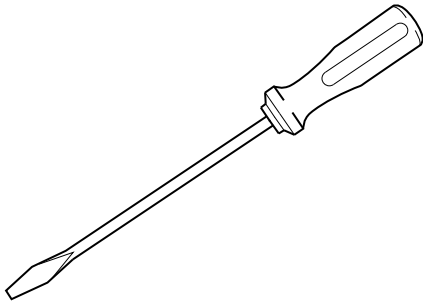
(a) Complete the table by adding the correct name for each component. The first one has been done for you.

Component Number	Component	Name
1		Circlip
2		
3		
4		
5		
6		
7		
8		

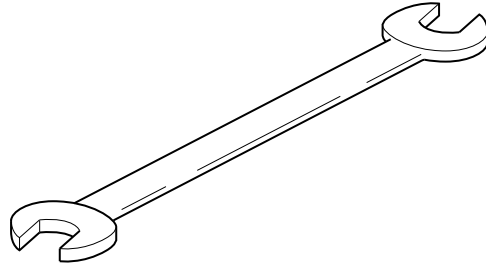
[7]

(b) Fig. 1 shows tools used with some of the components from the table in part (a).

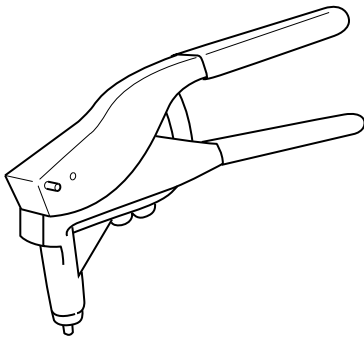
Complete Fig. 1 by adding the component number that each of the tools would be used for. One has been done for you.



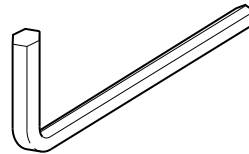
Component Number 5



Component Number \_\_\_\_



Component Number \_\_\_\_



Component Number \_\_\_\_

**Fig. 1**

[3]

[Total: 10]

- 2 Fig. 2 shows a drawer handle made in a school workshop from 3mm thick brass.

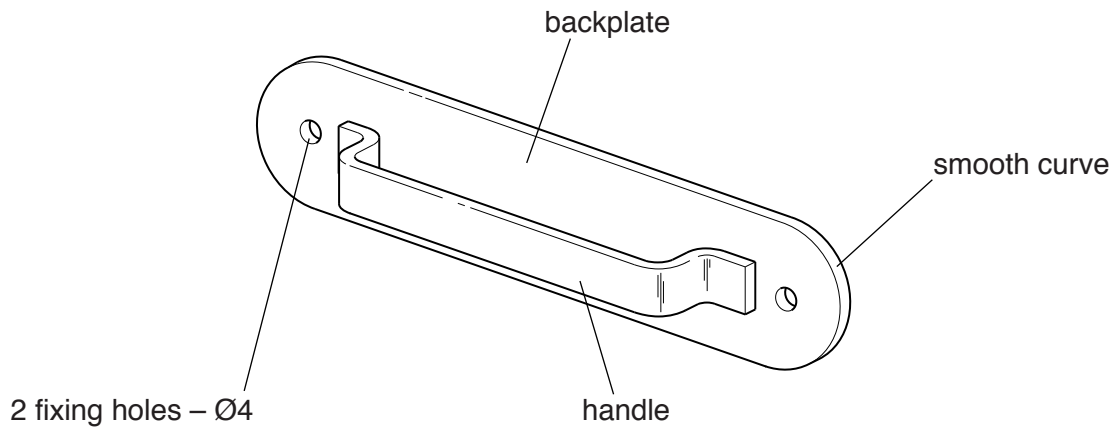


Fig. 2

- (a) Brass is an alloy.

- (i) State what is meant by the term “alloy”.

.....  
 ..... [1]

- (ii) Name **one** other metal alloy.

..... [1]

- (b) Complete the list below to give the stages needed to produce the smooth curve on the end of the backplate shown in Fig. 2.

1. Mark out the shape of the curve

2. ....

3. ....

4. ....

5. Smooth the curve with emery cloth [3]

- (c) The handle is fixed to the backplate by soft soldering.

Give **one** other method of fixing the handle to the backplate.

..... [1]

- (d) A batch of 50 drawer handles is to be made.

Design a jig that could be used when drilling the  $\varnothing 4$  fixing holes in the brass backplates.

The jig must:

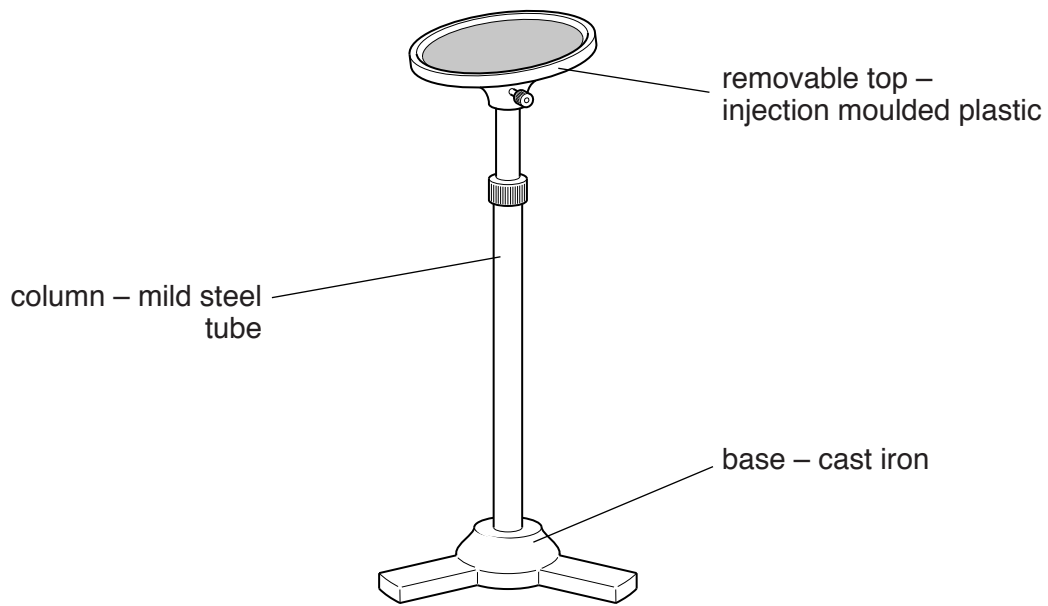
- position the holes accurately;
- hold the brass securely for drilling;
- be able to be held in a machine vice;
- be quick and easy to use.

[4]

[Total: 10]

Turn over

3 Fig. 3 shows an adjustable display stand.



**Fig. 3**

- (a) (i) Give **one** reason why injection moulding is a suitable process for making the removable top shown in Fig. 3.

.....  
 ..... [1]

- (ii) Give **one** suitable finish, other than painting, for the mild steel column of the display stand.

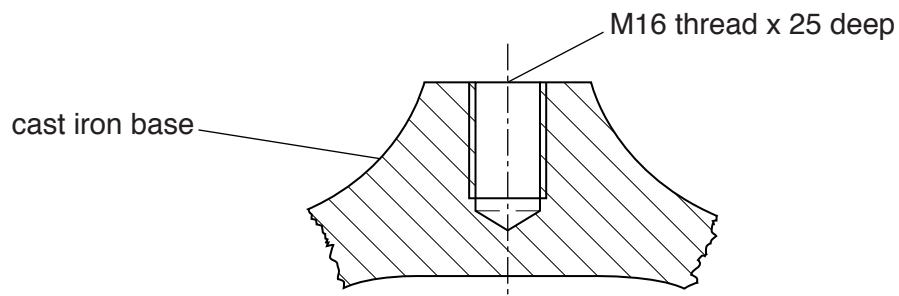
..... [1]

- (iii) Give **two** reasons why cast iron is a suitable metal for making the base of the display stand.

Reason 1 .....  
 ..... [1]

Reason 2 .....  
 ..... [1]

- (b) The column of the display stand is fitted into the cast iron base using a screw thread. Fig. 4 shows details of the thread in the base.



**Fig. 4**

Complete the table below to give the stages needed to put the M16 thread into the cast iron base.

	Stage
1	Mark out and centre punch the position of the hole
2	
3	
4	
5	
6	
7	

[6]

[Total: 10]

4 Fig. 5 shows two toast racks.

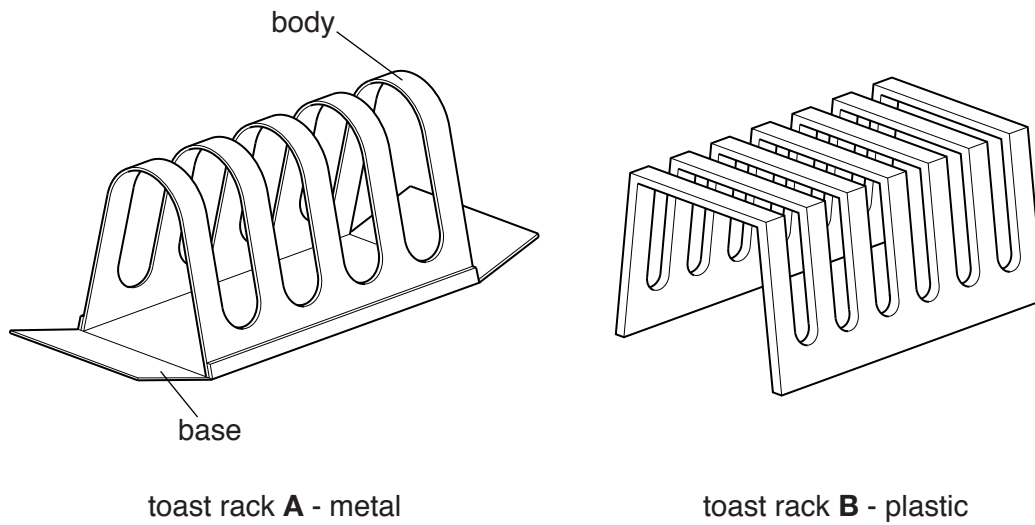


Fig. 5

(a) (i) Name **one** suitable metal for toast rack A.

..... [1]

(ii) Name the industrial process used to make toast rack A.

..... [1]

(iii) Give **two** reasons for fitting the base to toast rack A.

Reason 1 .....

..... [1]

Reason 2 .....

..... [1]



(b) An acrylic prototype for toast rack **B** is produced using CAD/CAM.

(i) Give **three** benefits, to the designer, of using CAD.

Benefit 1 .....  
..... [1]

Benefit 2 .....  
..... [1]

Benefit 3 .....  
..... [1]

(ii) Name **one** type of computer controlled machine suitable for cutting the slots in the acrylic prototype for toast rack **B**.

..... [1]

(iii) Give **two** benefits to the manufacturer, other than speed, of using CAM when making products in large quantities.

Benefit 1 .....  
..... [1]

Benefit 2 .....  
..... [1]

[Total: 10]

5 Fig. 6 shows a remote control.

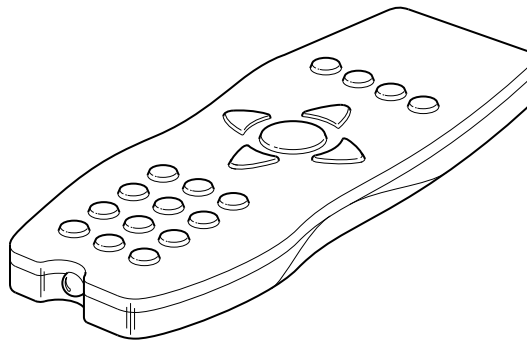


Fig. 6

(a) The case of the remote control is made from injection moulded plastic.

Give **two** benefits of using plastic for the case of the remote control.

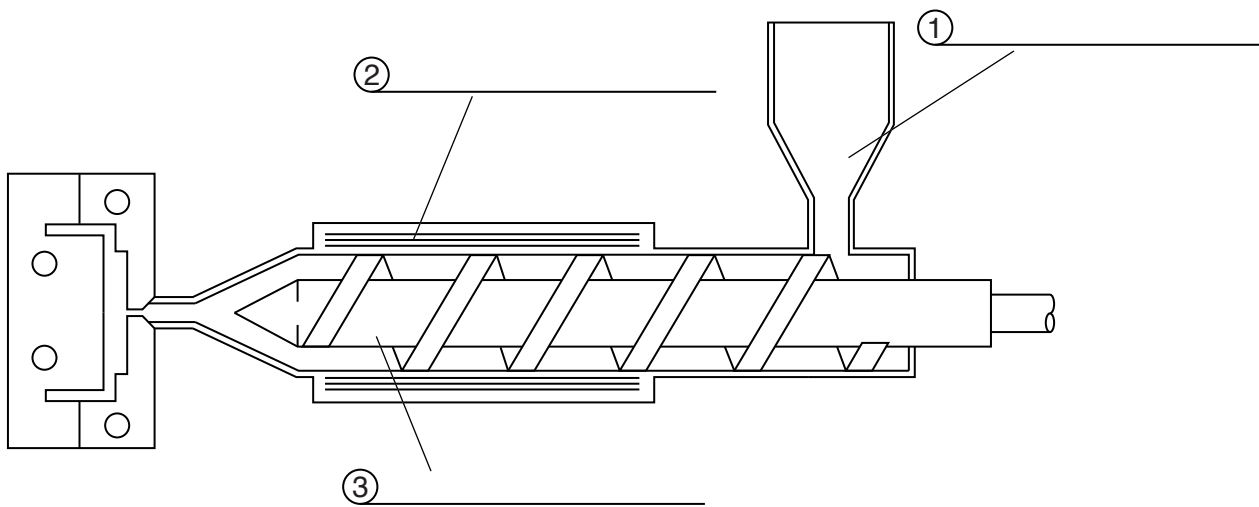
Benefit 1 .....  
 ..... [1]

Benefit 2 .....  
 ..... [1]

(b) Describe how ergonomics have been considered in the design of the remote control.

.....  
 .....  
 .....  
 ..... [2]

(c) Fig. 7 shows a line diagram of an injection moulding machine.



**Fig. 7**

- (i) Label the **three** parts of the injection moulding machine shown in Fig. 7. [3]  
 (ii) Explain how plastic injection mouldings are produced.

.....

.....

.....

.....

..... [2]

- (d) Name **one** other plastics moulding process.

..... [1]

**[Total: 10]**

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