OCR
RECOGNISING ACHIEVEMENT

Thursday 31 May 2012 – Afternoon

GCSE DESIGN AND TECHNOLOGY Industrial Technology

A544/01 Technical Aspects of Designing and Making

Candidates answer on the Question Paper.

OCR supplied materials:
None

Other materials required:
None

Duration: 1 hour 15 minutes

A544401

Candidate forename		Candidate surname	

Centre number						Candidate number				

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- 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).
- Answer **all** the questions in Section A **and** Section B.
- Do **not** write in the bar codes.

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 **60**.
- All dimensions are in millimetres.
- Your Quality of Written Communication will be assessed in questions marked with an asterisk **(*)**.
- This document consists of **16** pages. Any blank pages are indicated.

DC (SHW (CGW) 00653 12/10) 42459/7

Section A

Answer **all** questions.

1 Fig. 1 shows a variety of hand tools used in the workshop.

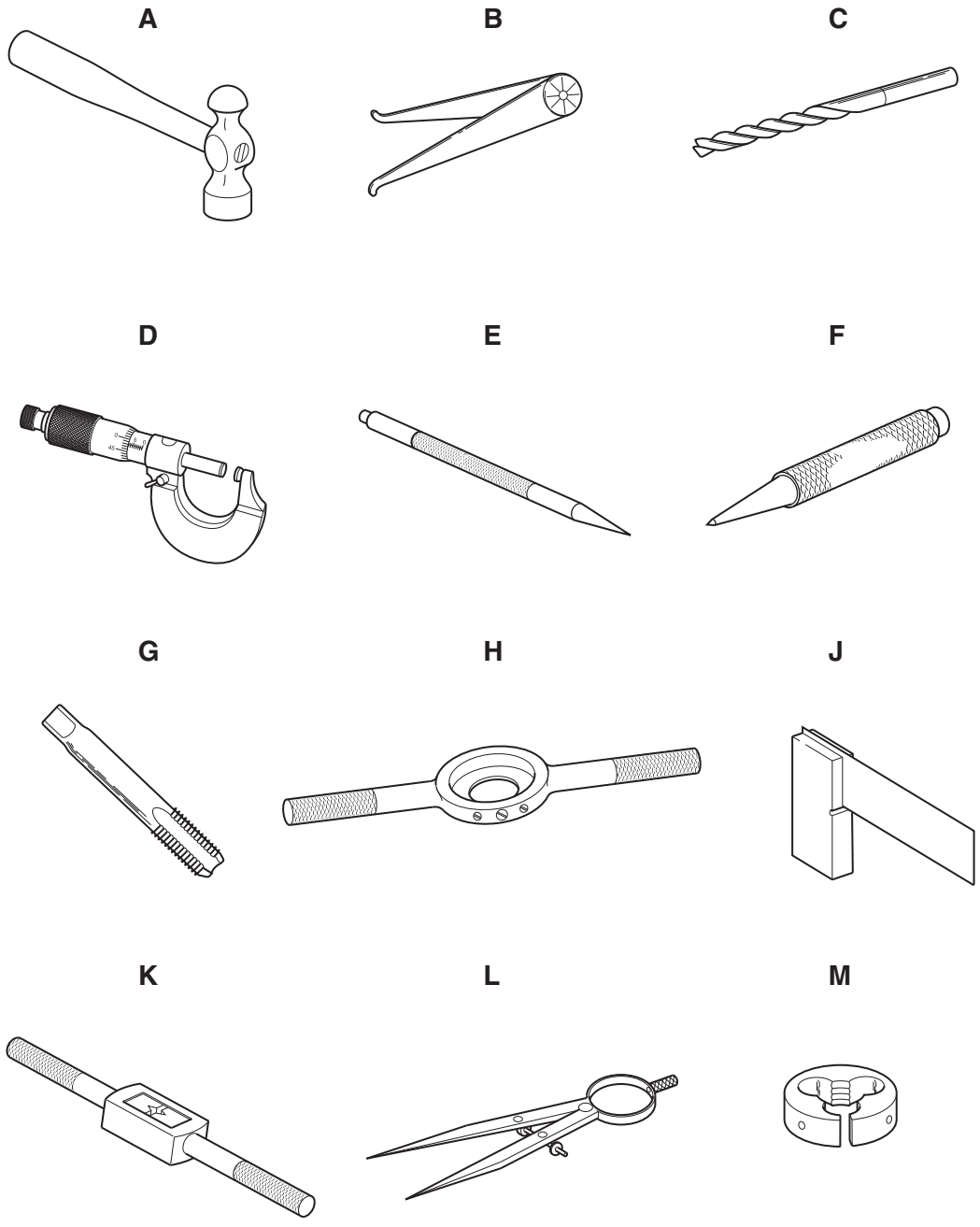

Fig. 1

(a) Some of the tools shown in Fig. 1 are often used together.

Complete the table below to show which tools are used together and what they are used for.

One has been done for you.

1st Tool	2nd Tool	Used for
A	**F**	Marking the centre of a hole before drilling
		Marking a line at right angles to the edge of a piece of metal
G		
	D	
H		

[8]

(b) Give **two** ways of making lines marked on metal stand out more clearly.

1. .....

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

(c) Give **two** benefits of using templates and jigs when making products in batches.

1 .....

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2 .....

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

[Total: 12]

2 Fig. 2 shows a tool used to remove weeds from the gaps between paving slabs.

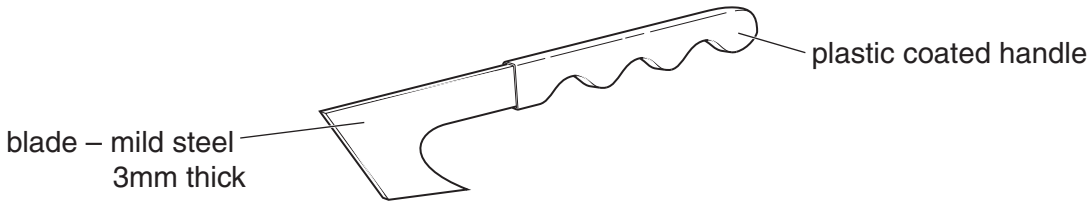

Fig. 2

(a) Complete the list below to give the stages needed to plastic-coat the handle of the tool shown in Fig. 2.

Stage 1 Clean the metal with emery cloth.

Stage 2 .....

Stage 3 .....

Stage 4 .....

Stage 5 Trim off excess plastic with a craft knife. **[3]**

(b) The mild steel blade of the tool shown in Fig. 2 is found to go blunt quickly.

Give **two** ways of making the blade more durable.

1. .....

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2. .....

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

(c) Describe how ergonomics has been used in the design of the tool shown in Fig. 2.

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

(d) The tool shown in Fig. 2 is produced in batches by laser cutting.

(i) Give **two** advantages of producing the tool by laser cutting compared with traditional presswork.

1 .....

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2 .....

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

(ii) Explain the benefits to a manufacturer of using batch production methods.

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..... **[3]**

[Total: 12]

3 Fig. 3 shows a prototype for a safety goggles holder. It has been made by line-bending 4 mm thick acrylic sheet.

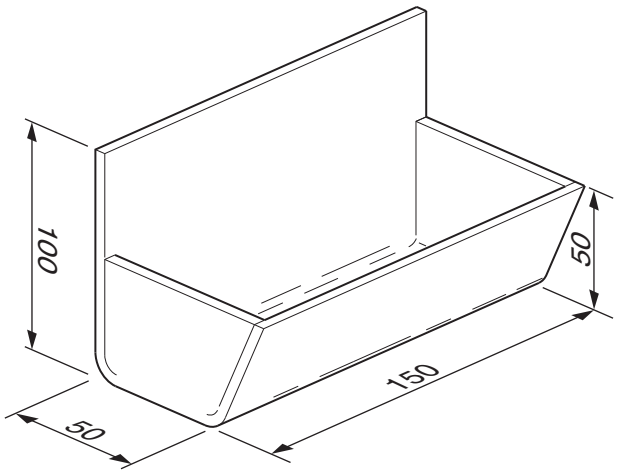
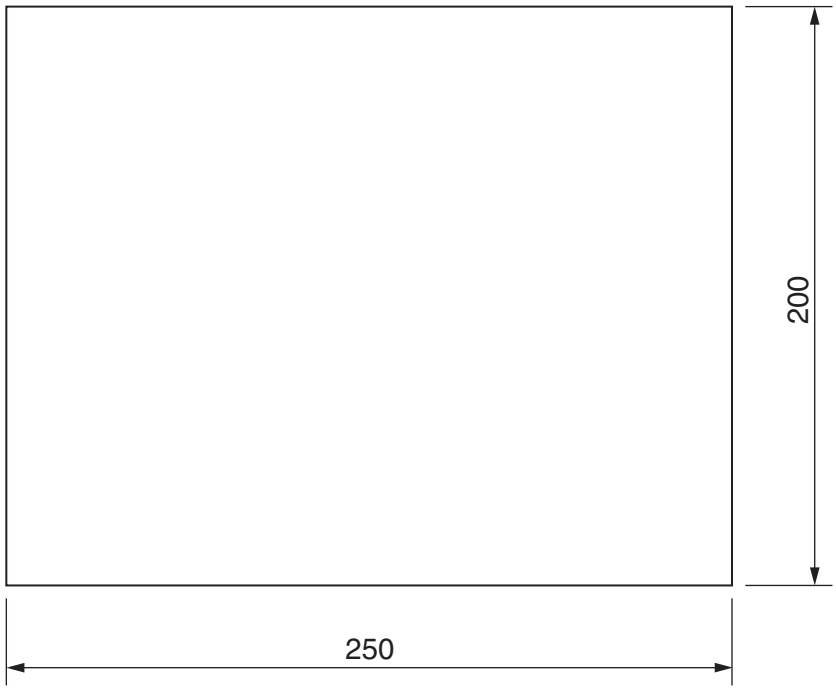


Fig. 3

(a) The safety goggles holder is to be made from a blank of acrylic sheet 250 × 200 × 4.

(i) Draw the development (net) of the safety goggles holder on the blank shown below.



not to scale

[2]

(ii) Name **two** hand tools that could be used to cut out the development (net) shown in part **(a)(i)**.

1. .....

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

(b) Use sketches and notes to show a design modification that will allow the safety goggles holder shown in Fig. 3 to be:

- fixed securely to a wall
- easily removed for cleaning.

[2]

Turn over for the remainder of question 3

(c)* Discuss the benefits to a manufacturer of using CAD/CAM when designing and making prototypes for new products.

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..... **[6]**

[Total: 12]

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Section B Question 4 starts on page 10

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Section B

Answer **all** questions.

4 Fig. 4 shows a lamppost bracket for hanging baskets. The bracket is made in two parts from 5 mm thick mild steel.

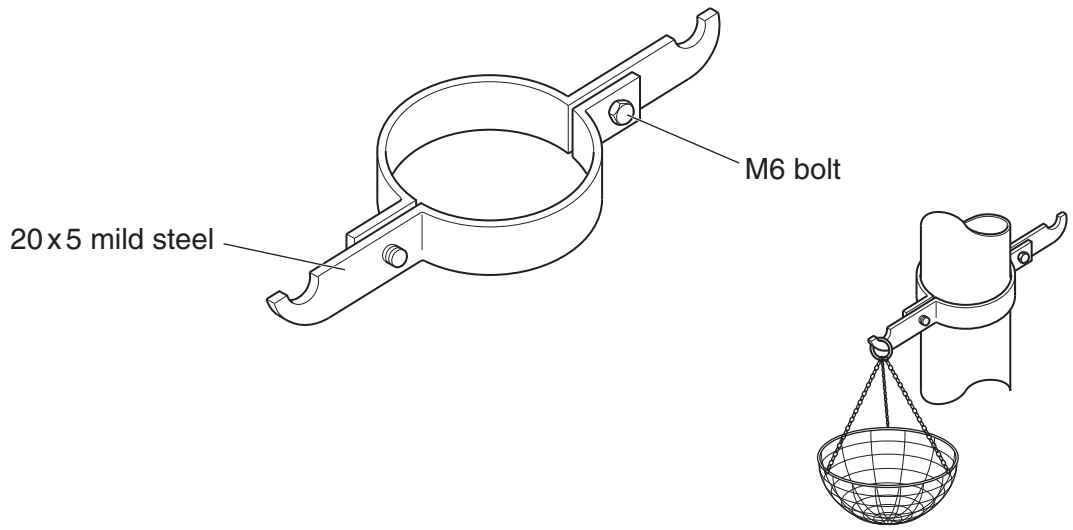

Fig. 4

(a) Give **two** benefits to the environment of using mild steel for the bracket shown in Fig. 4.

1. .....

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

(b) The bracket is clamped around the lamppost using two M6 bolts screwed into threaded holes.

(i) Complete the stages needed to cut the 6 mm thread in the bracket.

Stage 1 Mark the centre of the hole using a centre punch.

Stage 2 .....

Stage 3 .....

Stage 4 .....

Stage 5 .....

Stage 6 Check that the bolt fits the thread in the hole. **[4]**

(ii) Give **two** methods of preventing the bolts from coming loose after fitting the bracket.

1 .....

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

(c) Use sketches and notes to design a method of securing the hanging baskets on the bracket shown in Fig. 4.

The design must:

- prevent the hanging baskets from being stolen
- allow the hanging baskets to be removed when required.

Include details of processes and components used.

[4]

[Total: 12]

5 Fig. 5 shows a kitchen pedal bin.

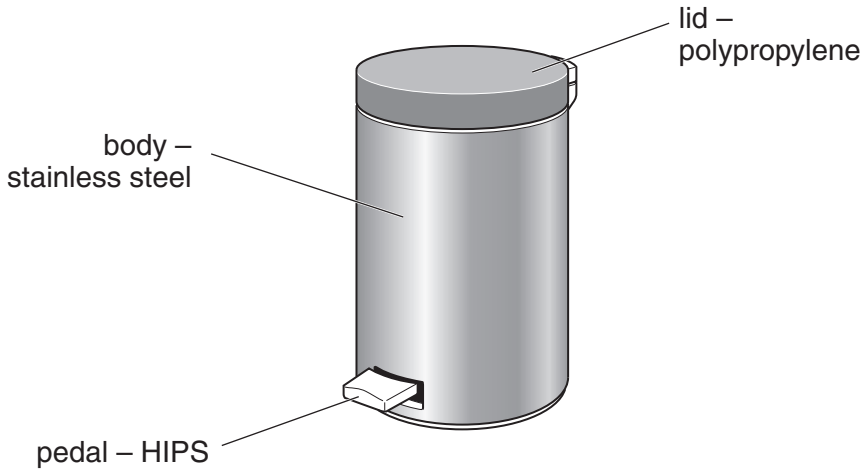

Fig. 5

(a) Complete the list below by adding **two** more important specification points for the kitchen pedal bin shown in Fig. 5.

- The lid of the pedal bin must open easily using the pedal.
- The lid must close automatically when the pedal is released.
- .....
- .....

[2]

(b) Name the industrial process used to produce the polypropylene lid shown in Fig. 5.

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

(c) Fig. 6 shows a cross-section of the pedal bin and lid.

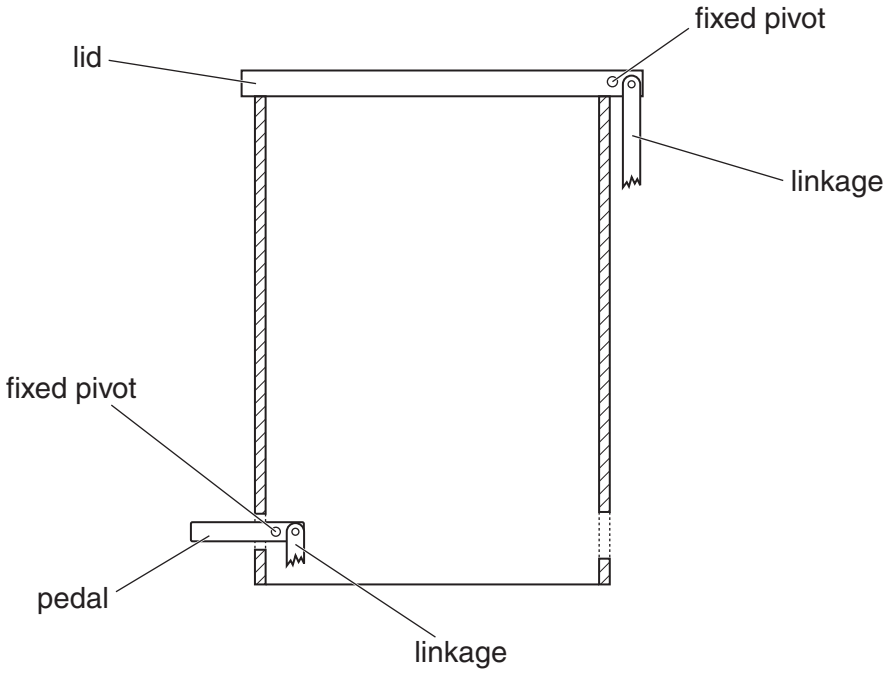

Fig. 6

Complete Fig. 6 to show a linkage that could be used to open the lid of the pedal bin when the pedal is pressed down.

Show clearly all fixed and moving pivots. **[3]**

Turn over for the remainder of question 5

(d)* The pedal bin shown in Fig. 5 is made from a variety of different materials.

Discuss the issues a manufacturer must consider when making products from different materials.

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