

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

A544

Industrial Technology
Technical Aspects of Designing and Making

Candidates answer on the question paper.

OCR supplied materials:
None

Other materials required:
None

**Monday 17 January 2011
Afternoon**

Duration: 1 hour 15 minutes



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. 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






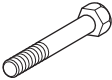
- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **60**.
- All dimensions are in millimetres.
- Your Quality of Written Communication is assessed in questions marked with an asterisk (*).
- This document consists of **12** pages. Any blank pages are indicated.

Section A

Answer **all** questions.

1 The table below shows standard pre-manufactured components used when assembling metal parts.

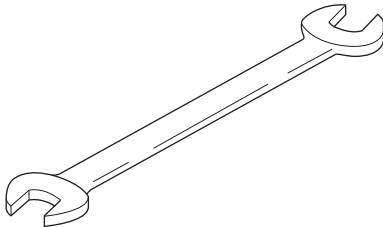
(a) (i) Complete the table below by giving the correct name for each component. One has been done for you.

	Component	Correct Name		Component	Correct Name
A		Circlip	D		
B			E		
C			F		

[5]

(ii) Fig. 1 shows tools used with two of the components in the table above.

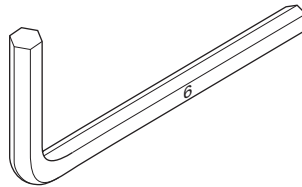
Complete Fig. 1 by giving the name of Tool 2 and the component it is used with. Tool 1 has been completed as an example.



Tool 1

Name Spanner

Used with component F



Tool 2

Name _____

Used with component ____

[2]

Fig. 1

(b) In the space below, use sketches and notes to describe **one** method used to stop nuts working loose.

[2]

(c) Explain why manufacturers often use standard pre-manufactured components.

.....

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 12]

2 Fig. 2 shows a hosepipe support for use in a garden.

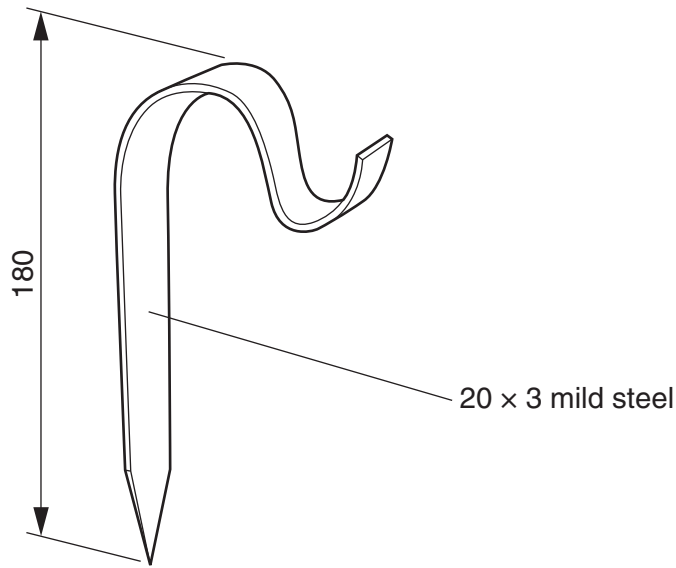


Fig. 2

(a) Give **two** reasons why mild steel is a suitable material for the hosepipe support.

Reason 1

.....

Reason 2

..... [2]

(b) Mild steel is a ferrous alloy.

Explain the term 'ferrous alloy'.

.....

.....

.....

..... [2]

- (c) Use sketches and notes to show a design for a bending jig that could be used to produce batches of the hosepipe support shown in Fig. 2.

The jig must:

- hold the mild steel strip firmly for bending
- ensure that all the hosepipe supports are identical
- allow the hosepipe supports to be produced quickly.

[4]

- (d) Use sketches and notes to describe **two** methods of stopping the hosepipe support bending in use.

Method 1

Method 2

[4]




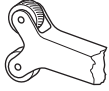
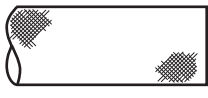
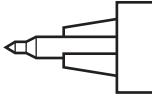
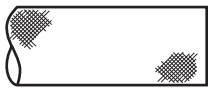
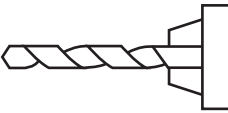
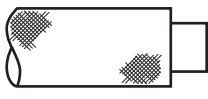
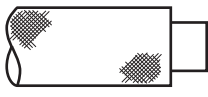
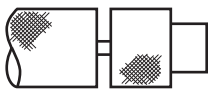
[Total: 12]

- 3 Fig. 3 shows a special nut made on a centre lathe in a school workshop.



Fig. 3

- (a) Complete the process chart below to show the sequence of operations to make the special nut shown in Fig. 3. Stages one and four have been completed as examples.

	Stage	Tool Used	Process
1			Face off end of bar
2			
3			
4			Drill hole for thread
5			Turn down to size
6			Start thread in hole
7			

[6]

(b) Give **three** safety precautions that must be taken when using a centre lathe.

- 1.
.....
- 2.
.....
- 3.
..... [3]

(c) Give **three** factors that should be considered when setting the speed on a centre lathe.

- 1.
.....
- 2.
.....
- 3.
..... [3]

[Total: 12]

Section B

Answer **all** questions.

- 4 Fig. 4 shows a charging station for a cordless telephone. The charging station is made from injection moulded plastic.

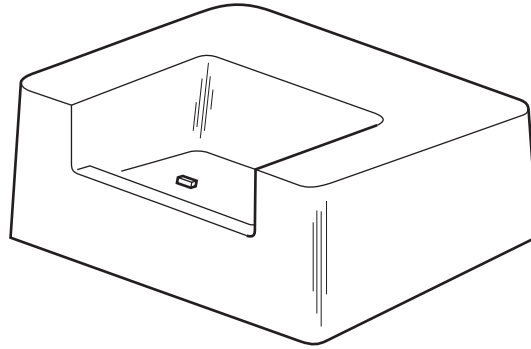


Fig. 4

- (a) The charging station has been designed using CAD.

(i) State what the letters CAD stand for.

C.....A.....D..... [1]

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

Benefit 1

.....

Benefit 2

.....

Benefit 3

..... [3]

- (b) Name **two** specific plastics suitable for making the charging station shown in Fig. 4.

1.

2. [2]

5 Fig. 5 shows a direction arrow made from 2 mm thick aluminium alloy sheet.

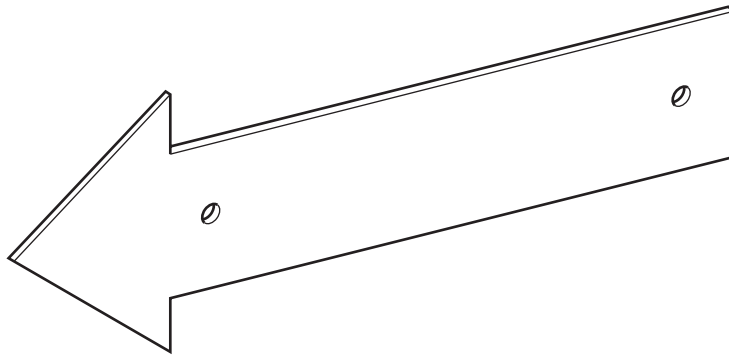


Fig. 5

(a) Name **two** hand tools that could be used to cut the outline of the direction arrow.

1.

2. [2]

(b) Give **two** suitable finishes, other than painting, for the direction arrow.

Finish 1

Finish 2 [2]

(c) Name **two** industrial processes that could be used to mass produce the direction arrow.

Process 1

Process 2 [2]

PLEASE DO NOT WRITE ON THIS PAGE



Copyright Information

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact the Copyright Team, First Floor, 9 Hills Road, Cambridge CB2 1GE.

OCR 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.