

Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

Forename(s)

Candidate signature

GCSE ENGINEERING

Unit 1 Written Paper

Tuesday 24 May 2016

Morning

Time allowed: 1 hour

Materials

For this paper you must have:

- normal writing and drawing instruments.

Instructions

- Use black ink or black ball-point pen. Use pencil only for drawing.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in the answer book. Cross through any work you do not want to be marked.
- All dimensions are given in millimetres unless otherwise stated.

Information

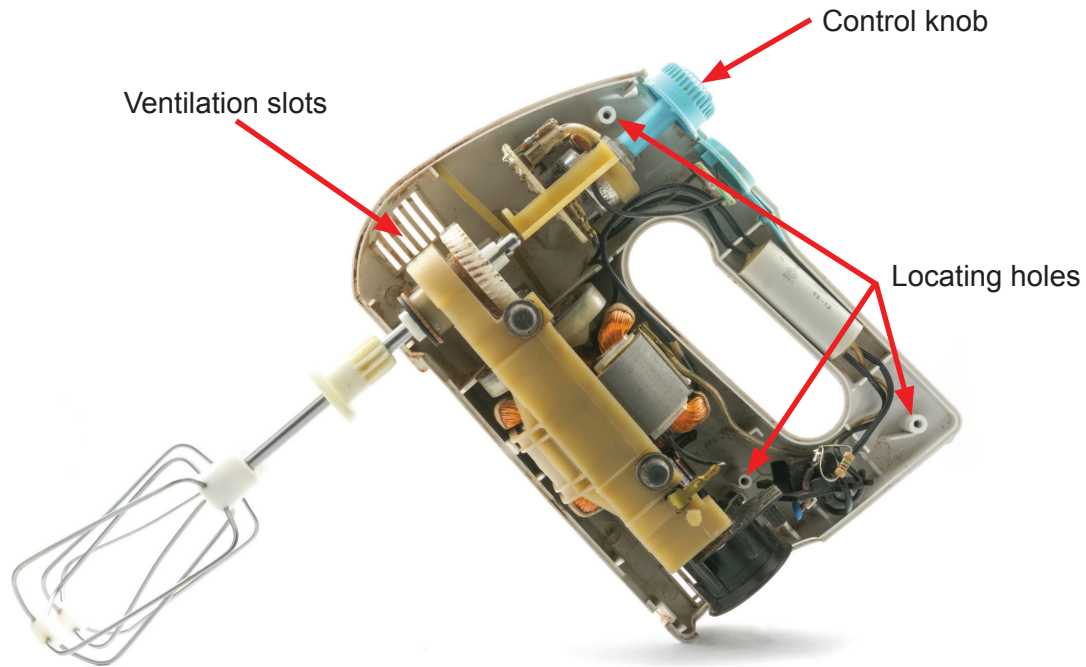
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 75.
- You are reminded of the need for good English and clear presentation in your answers. Quality of Written Communication will be assessed in Question 4(b)(i).



Answer **all** questions in the spaces provided.

- 1** **Figure 1** shows the inside of an electric whisk.

Figure 1



- 1 (a)** Describe the function of each labelled part.

[6 marks]

Control knob _____

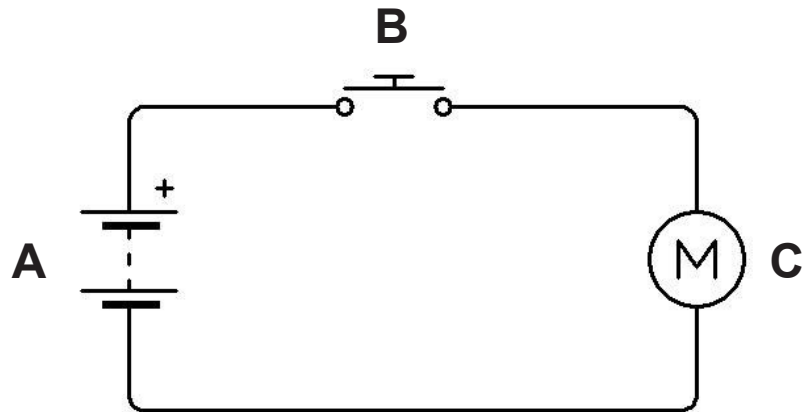
Locating holes _____

Ventilation slots _____



- 1 (b)** Electrically powered tools operate using an electrical circuit as shown in **Figure 2**.

Figure 2



- 1 (b) (i)** In the spaces below, identify the components labelled **A** to **C**.

[3 marks]

A _____

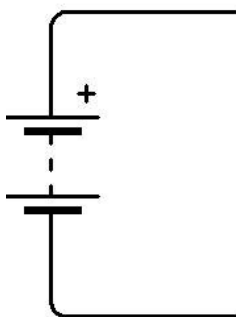
B _____

C _____

- 1 (b) (ii)** Some electrical tools have Light Emitting Diodes (LEDs) that light up.

Complete the circuit diagram below to include an LED and resistor.

[2 marks]



Turn over ►



1 (b) (iii) Describe the function of an electrical switch.

[2 marks]

1 (b) (iv) Describe the function of a resistor.

[2 marks]

15



2 Figures 3 and 4 show two types of whisk.

Figure 3



Figure 4



Describe **three** differences between the two types of whisk.

[6 marks]



3 (a) All metals are classified as ferrous or non-ferrous.

Complete the table below to show the correct category and a typical use for each metal. The first one has been completed for you as an example.

[6 marks]

Metal	Category	Typical use
Aluminium	Non-Ferrous	Drinks cans
Stainless Steel		
Copper		
Cast Iron		

3 (b) Using notes and sketches describe a welding process.

[4 marks]



3 (c) Riveting is a method of joining sheet materials together.

Give **one** advantage and **one** disadvantage of using riveting. In each case you should fully explain your answers.

[6 marks]

Advantage _____

Disadvantage _____

16

Turn over for the next question

Turn over ►



- 4 An electric jigsaw is shown in **Figure 5**. It can be used to cut sheet metals.

Figure 5



- 4 (a) Name **three** health and safety hazards when handling or cutting sheet metal.

For each hazard, suggest a safety measure.

[6 marks]

Hazard 1 _____

Safety measure _____

Hazard 2 _____

Safety measure _____

Hazard 3 _____

Safety measure _____



[6 marks]

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

[4 marks]

- 5 Garden hedge trimmers often look like the one shown in **Figure 6**.

Figure 6



A client asks a designer to create a new garden hedge trimmer.

Suggest **three** user requirements a designer would need to research before producing a specification for the trimmer.

For each requirement, state **one** reason why the designer would need the information.

[6 marks]

Requirement 1 _____

Reason _____

Requirement 2 _____

Reason _____

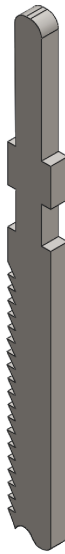
Requirement 3 _____

Reason _____



6 **Figure 7** shows an image of a typical jigsaw blade.

Figure 7

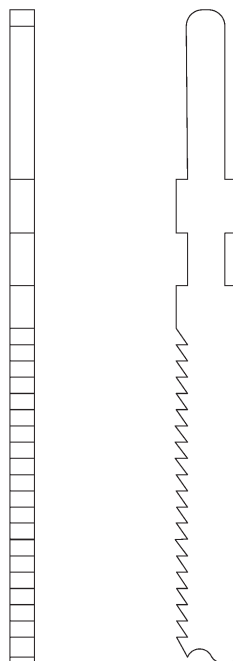


The maximum dimensions of the blade are as follows:

Length = 140 mm
Width = 12 mm
Thickness = 3 mm

Using standard drawing conventions, label the drawing below to show **two** dimensions of the blade.

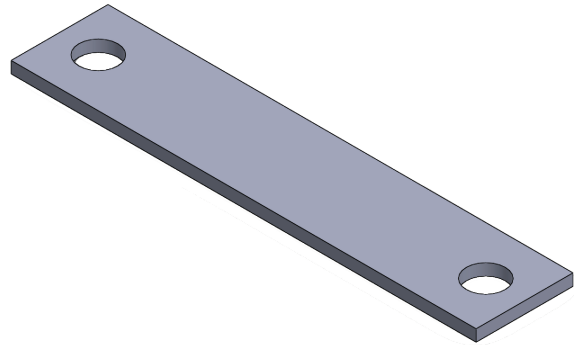
[4 marks]



- 7 A pillar drill is used to make two holes in a length of low carbon (mild) steel bar as shown in **Figure 8**.

Figure 8

Length of bar	200 mm
Width of bar	50 mm
Diameter of holes	20 mm
Distance between centres	160 mm



- 7 (a) Describe the process of accurately marking and drilling the holes.

[4 marks]



7 (b) (i) A manufacturer wants to make a batch of 100 of the bars shown in **Figure 8**.

Using notes and sketches show how the holes are drilled in the correct position without marking them out.

[4 marks]

7 (b) (ii) Give **four** benefits of using jigs or templates when manufacturing products.

[4 marks]

Benefit 1 _____

Benefit 2 _____

Benefit 3 _____

Benefit 4 _____

END OF QUESTIONS

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