



Please write clearly in block capitals.

Centre number

Candidate number

Surname _____

Forename(s) _____

Candidate signature _____

GCSE ENGINEERING

Unit 1 Written Paper

Wednesday 24 May 2017

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 this 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 3.

For Examiner's Use	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
TOTAL	



J U N 1 7 4 8 5 0 1 0 1

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

- 1 **Figure 1** shows an MP3 player which has a case made from metal.

Figure 1



- 1 (a) (i) Name a suitable metal which could be used to manufacture the case.

[1 mark]

- 1 (a) (ii) Describe **two** benefits to the manufacturer of using the metal you have named in part (a)(i) to make the case.

[4 marks]

Benefit 1 _____

Benefit 2 _____

- 1 (a) (iii) Metal alloys are often used in the manufacture of products. Explain what is meant by the term 'metal alloy' and why they are used.

[2 marks]



1 (b) **Figure 2** shows a typical pair of earphones/earbuds which could be used with an MP3 player.

Figure 2



1 (b) (i) Describe the function of each labelled part.

[6 marks]

Cable _____

Earpiece _____

Case _____



Turn over ►

1 (b) (ii) Using notes and/or sketches, explain how sound is produced by the earphones/earbuds when listening to an MP3 player.

[3 marks]



2 **Figure 3** shows an audio jack plug.

Figure 3

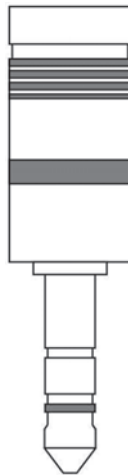


2 (a) The dimensions of the plug are as follows:

Length = 36.3 mm. Maximum diameter = 10.2 mm.

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

[4 marks]



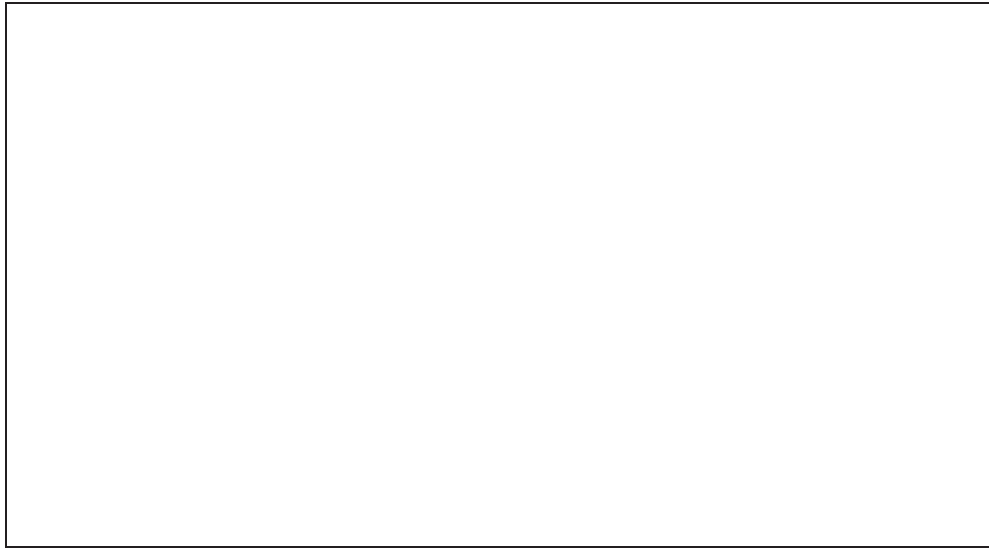
Question 2 continues on the next page



2 (b) (i) Components are often drawn using orthographic projection.

In the box below, draw the symbol for third angle orthographic projection.

[2 marks]



2 (b) (ii) Engineers have to work to tolerances when designing and manufacturing components.

Describe **two** advantages and **one** disadvantage of working within tolerance.

[6 marks]

Advantage 1 _____

Advantage 2 _____

Disadvantage 1 _____



2 (b) (iii) A component is designed to have a length of 30 mm ± 0.1 .

What are the acceptable finished dimensions? Show your calculations.

[2 marks]

2 (b) (iv) Name a device which could be used to accurately check the dimensions of the component. Describe how the device would be used.

[3 marks]

Device _____

Description of use _____

17

3 Personal electronic devices are often replaced when newer versions become available.

Discuss the environmental effects when disposing of electronic devices at the end of their useful life.

Quality of Written Communication will be assessed in your answer.

[6 marks]

6



Turn over ►

4 Personal electronic devices contain Printed Circuit Boards (PCBs) which are usually manufactured using Computer Numeric Control (CNC) equipment.

Explain **three** advantages to the manufacturer of using CNC equipment to make PCBs.

[6 marks]

Advantage 1 _____

Advantage 2 _____

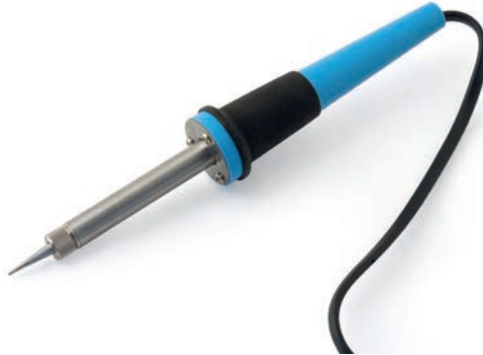
Advantage 3 _____

6



- 5 A soldering iron is shown in **Figure 4**. It is used to solder electronic circuits.

Figure 4



Name **three** health and safety hazards when using a soldering iron.

For each hazard, suggest a safety measure.

[6 marks]

Hazard 1 _____

Safety measure _____

Hazard 2 _____

Safety measure _____

Hazard 3 _____

Safety measure _____




6

Turn over for the next question



- 6 The table below shows tools which are used by engineers. Complete the table by using the appropriate letter from the word/image bank opposite.

[7 marks]

Picture	Tool name	Typical use
	Tap	
		Used for cutting material
	Centre punch	Used to make an indent in a material
	Micrometer	
	Spring dividers	
	Die	Used for cutting external threads



A
Used for enlarging holes

B
Nut

C
Coping saw

D
Used for cutting internal threads



H
Used for making accurate measurements

I
Used to transfer measurements or mark curves

J
Hacksaw

K
Used for tightening nuts



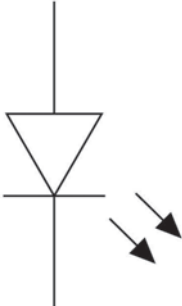
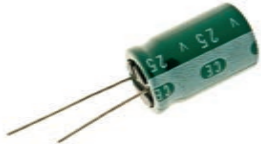






Turn over for the next question



- 7 The table below shows a range of electronic components used in personal electronic devices. Complete the table by inserting the correct symbol and name for the components pictured.

[6 marks]

Picture	Component Symbol	Name
		Resistor
		
		
		
		



- 8 Handheld games consoles are manufactured in various shapes and sizes. An example is shown in **Figure 5**.

Figure 5



- 8 (a) A client asks a designer to create a new handheld games console.

Suggest **four** specification points for the new console.

[4 marks]

Specification point 1 _____

Specification point 2 _____

Specification point 3 _____

Specification point 4 _____

Question 8 continues on the next page



8 (b) In the space below, sketch a design for a new console which meets the specification points given in part (a).

Use annotation to show how the design meets the specification.

[7 marks]

END OF QUESTIONS

11



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