

Centre Number						Candidate number				
Surname										
Other names										
Candidate signature										

For examiner's Use	
Examiner's initials	
Question	Mark
1	
2	
3	
4	
5	
6	
TOTAL	

Engineering

Unit 1 Written paper

Monday 7th March 2016

For this paper you must have:

- Normal writing and drawing equipment.

Time allowed

- 1 Hour

Instructions

- Use black ink or black ball-point pen.
- 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 book. Cross through any work you do not want to be marked.

Information

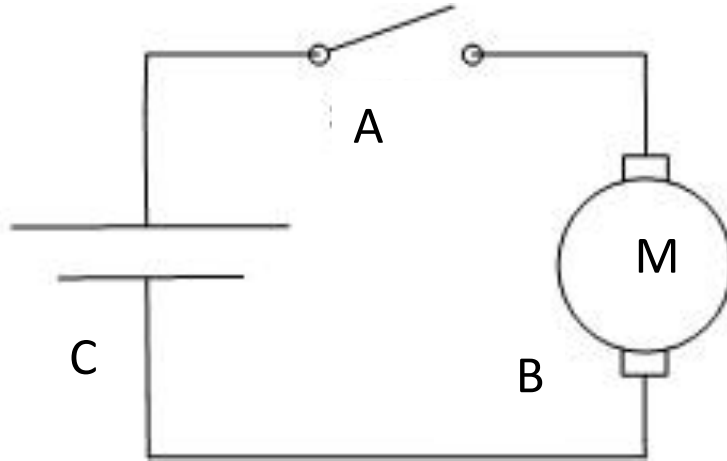
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 75.
- You are reminded of the need for good English and clear presentation in your answers. Quality of Written communication will be assessed in Question 1 (f).

SECTION A

Answer **all** questions.

- 1 Power tools need electronic circuits to power a motor.
Figure 1 shows part the circuit diagram.

Figure 1



- 1(a) Name the 3 components on the diagram:

A:.....

B:.....

C:.....

(3 marks)

- 1 (b) (i) On the drill below label the 3 parts named above.



(3 marks)

- 1 (b) (ii) If the drill says it is 18V drill, what does the V stand for?

.....

1 (c) Study the pictures below, then answer the following questions.



1 (c) (i) What is the name of the power tool above?

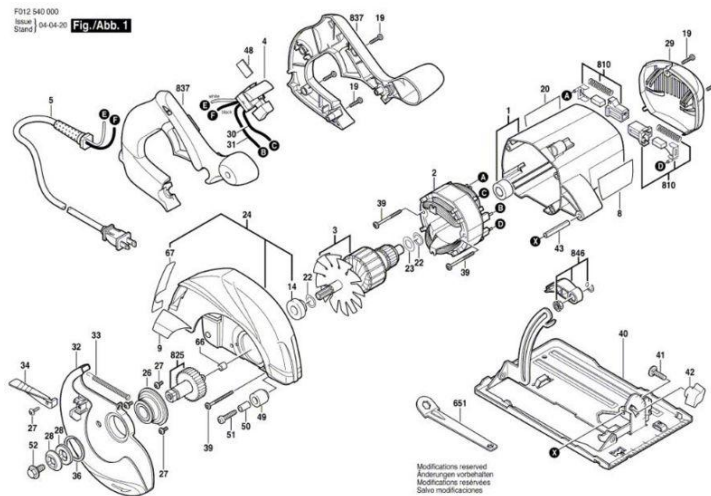
.....

1 (c) (ii) Name 1 safety feature on the tool and explain how it prevents accidents.

.....

.....

(3 marks)



1 (d) (i) What is the name of the diagram is shown above?

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1 (d) (ii) Explain the benefits of this type of diagram and why it is used in engineering?

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.....

(3 marks)

1 (e) In the spaces below, write **three** specification points that could have been used on the design of the drill, add relevant detail to each.

Specification point 1

.....
.....
.....
.....

Specification point 2

.....
.....
.....
.....

Specification point 3

.....
.....
.....
.....

(6 marks)

Question 1 continues of the next page

2 Below is picture of a power drill. There are different types of motion on a power drill, this question is about those motions.



2 (a) Describe each on of these motions:

(i) linear

.....

(ii) Rotary

.....

(iii) Oscillating

.....

(iv) Reciprocating

.....

(4 marks)

2 (b) (i) Which part of the drill has a **rotary** motion?

.....

2 (b) (ii) Which part of the drill has a **reciprocating** motion?

.....

(2 marks)

SECTION B

Answer **all** questions.

3 Shown below is an angle grinder. It has a spinning disc which is used to remove excess material. Study **Figure 2**, then answer the questions which follow.

Figure 2



3 (a) (i) The gearbox casing is made from a magnesium alloy, what properties does it need to have?

.....

.....

.....

.....

(2 marks)

3 (a) (i) The handle is made from ABS, why did the manufacturer chose this material?

.....

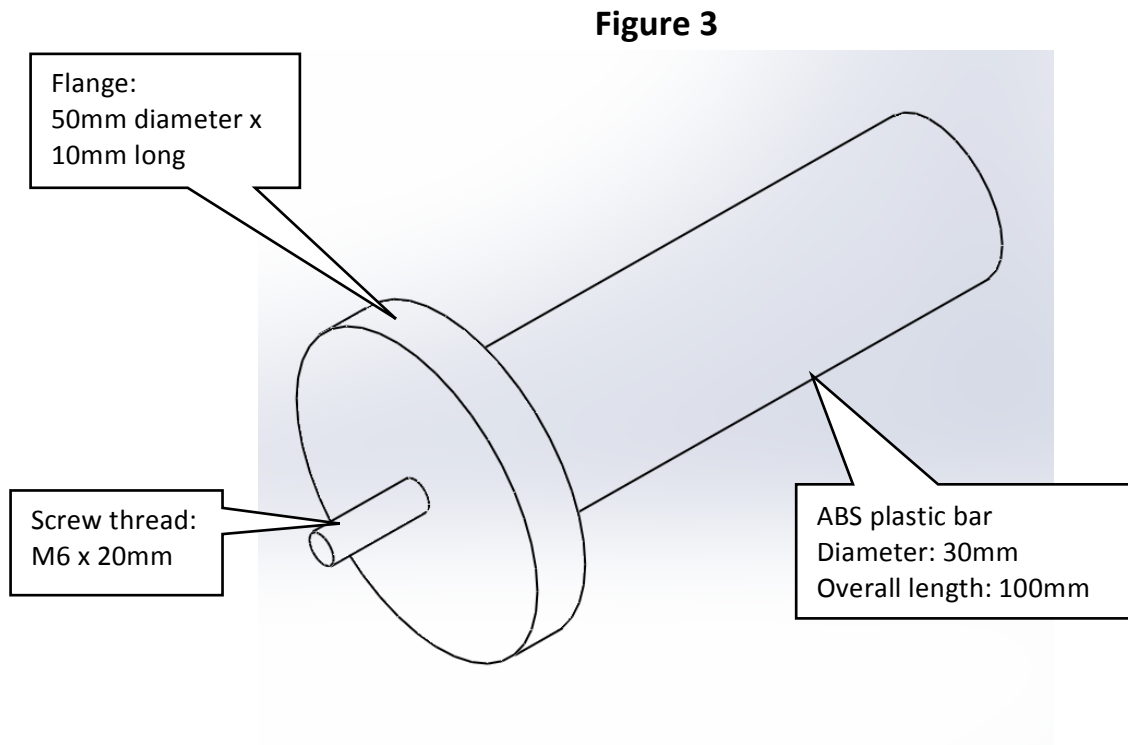
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(2 marks)

4 **Figure 3** below an image of the handle of the angle grinder.



4 (a) Use the information supplied in **Figures 3** and **4** to complete the side elevation in Figure 4 to an appropriate standard by carrying out the following tasks.

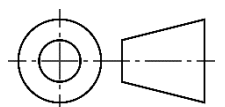
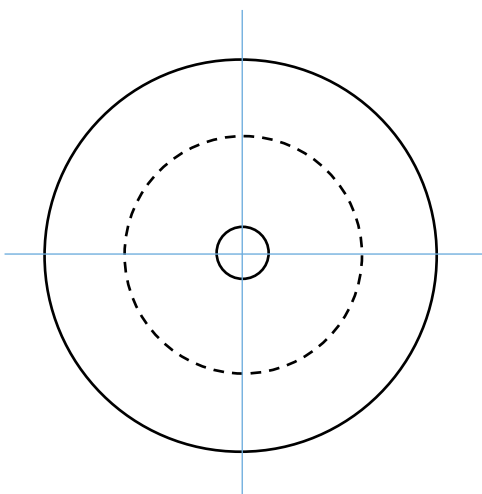
4 (a) (i) Complete the side elevation of the handle show.

(4 marks)

4 (a) (ii) Add one accurate linear dimension.

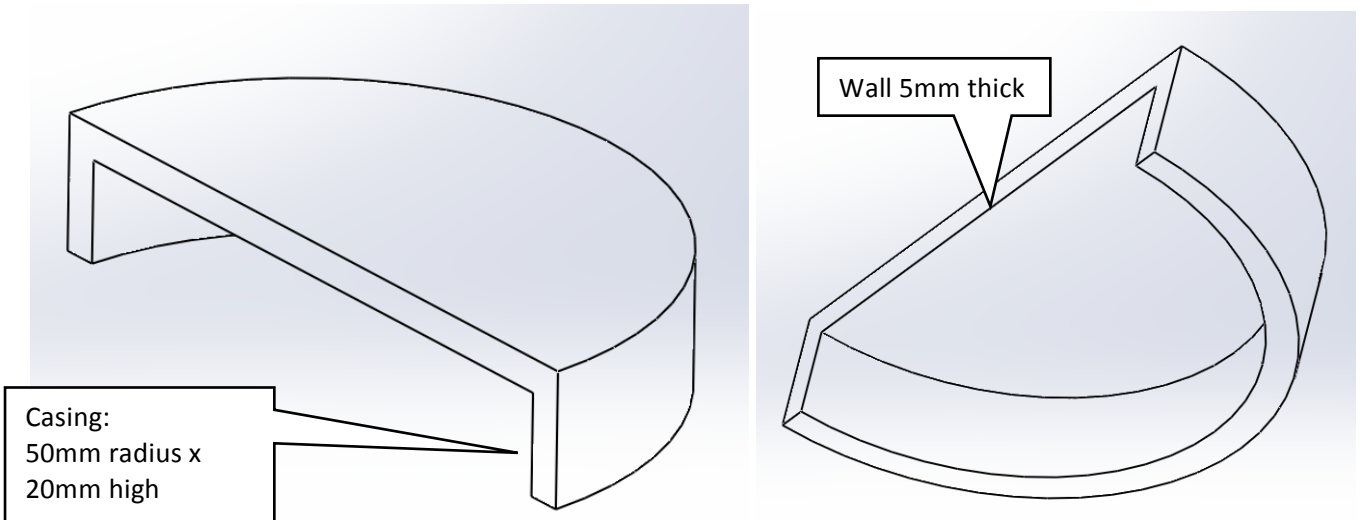
(2 marks)

Figure 4



4 (b)

Figure 5 below are 2 images of the guard of the angle grinder.



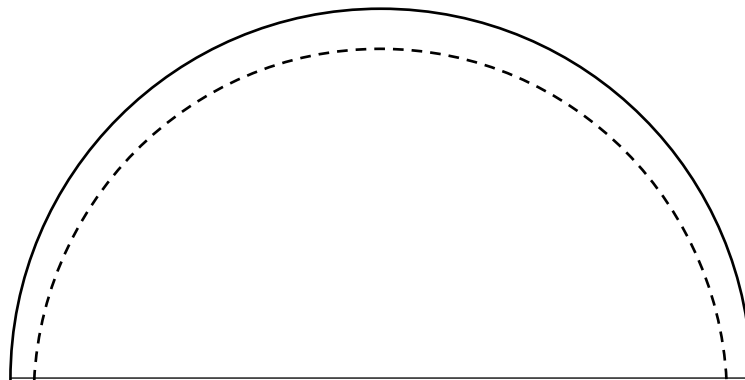
4 (b) Use the information supplied in Figures 5 and 6 to complete the front elevation in Figure 6 to an appropriate standard by carrying out the following tasks.

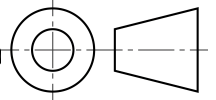
4 (b) (i) Complete the front elevation of the guard.

(4 marks)

4 (b) (ii) Add one accurate **non-linear** dimension.

(2 marks)





4 (c) In the table below, create a Production Plan listing five major operations needed to complete the handle if it were to be made from aluminium. Select from the list given below the table by inserting the identification **letter (A to J)** in the appropriate box.

Order	Operation	Tools and equipment	Description of task carried out
1	Material Preparation		
2	Turning		
3	Threading		
4	Doming		
5	Polishing		

Use the information below to complete the Production Plan.

Doming tool: **A**

Hacksaw: **F**

Buffing wheel and abrasives: **H**

Create a filleted end to the bar: **C**

Cut 6mm stainless steel bar to length: **B**

Produce a high quality shining surface to frame: **E**



Cut an M4 thread on one end of the machined stainless steel bar to fit the tail fin supplied: **G**

Reduce stainless steel bar to 4mm diameter for a distance of 15mm at each end: **J**


Lathe: **D**

Die and die stock: **I**

5 Below are 3 pieces of equipment that can be used in an engineering workshop, complete the table

	Equipment name	Equipment use
		
		

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22

		
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(6 marks)

END OF QUESTIONS

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6