



**1145-502 JUNE 2018**  
**Level 2 Technical Award in Engineering**  
 Level 2 Engineering – Theory exam (1)

If provided, stick your candidate barcode label here.

**Monday 18 June 2018**  
**13:30 – 15:30**

Candidate name (first, last)

First

Last

Candidate enrolment number

Date of birth (DDMMYYYY)

Gender (M/F)

Assessment date (DDMMYYYY)

Centre number

Candidate signature and declaration\*

- If any additional answer sheets are used, enter the additional number of pages in this box.
- Please ensure that you **staple** additional answer sheets to the **back** of this answer booklet, clearly labelling them with your full name, enrolment number, centre number and qualification number in BLOCK CAPITALS.
- All candidates need to use a **black/blue pen**. **Do not** use a pencil or gel pen.
- If provided with source documents, these documents **will not** be returned to City & Guilds, and will be shredded. **Do not** write on the source documents.

**\*I declare that I had no prior knowledge of the questions in this assessment and that I will not divulge to any person any information about the questions.**

**General instructions**

- Use black or blue ballpoint pen.
- The marks for questions are shown in brackets.
- There are **eight questions** in this examination paper. Answer **all** questions.
- Answer the questions in the spaces provided. Answers written in margins will **not** be marked.
- Cross through any work you do **not** want to be marked.
- Write **all** of your working out and answers in this booklet.
- If extra space is required, then the blank pages at the back of the pack should be used, clearly identifying the question.



1 a) What does the symbol in Figure 1 represent on an orthographic drawing? (1 mark)

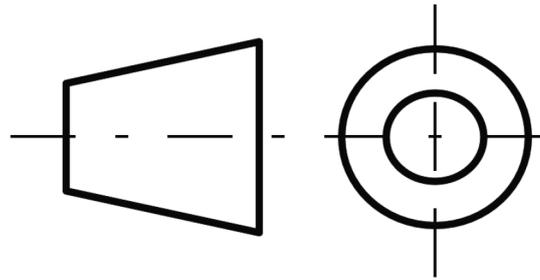


Figure 1

b) An orthographic projection of an engineered product is shown in Figure 2. Label the **three** views shown. (3 marks)

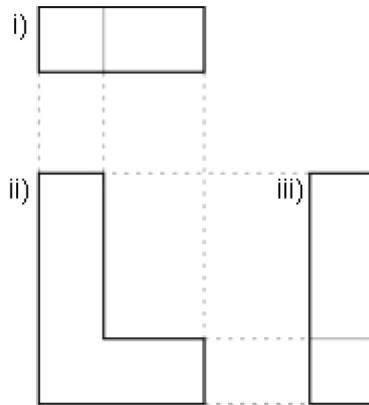


Figure 2

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c) State the meaning of **each** of the following abbreviations on an engineering drawing.  
i) CHAM. (1 mark)

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ii) CSK. (1 mark)

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(Total marks 6)

2 a) Define **each** of the following material properties.

i) Thermal conductivity. (1 mark)

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ii) Hardness. (1 mark)

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b) i) A motor is a commonly used electrical component. What is the function of a motor? (1 mark)

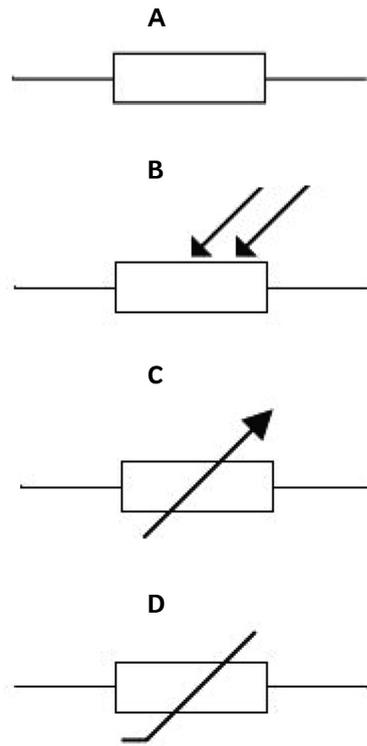
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ii) State the unit in which the electrical power of a motor is measured. (1 mark)

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c) i) Which one of the following is the symbol for a thermistor? (1 mark)



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ii) Describe the function of a thermistor. (1 mark)

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iii) Give **one** practical application of a thermistor and explain how it is used in this application. (3 marks)

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(Total marks 9)

3 a) Turning is used to remove material from a component. Give an example of an application where this might be used. (1 mark)

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b) For **each** of the following types of materials, name **one** typical product that can be made from them. (1 mark)

i) Thermosetting polymer.

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ii) Engineering ceramic. (1 mark)

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c) Describe the properties of a thermochromic material and give **one** typical example of an application of this material. (2 marks)

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d) Name **two** types of adhesives used by engineers. (2 marks)

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(Total marks 7)

4 a) Give **four** reasons why a designer would use a block model to create a prototype product.

(4 marks)

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b) Prototype models can be made from foam blocks. Describe **two** ways in which a model made from foam blocks can be rendered to give it a realistic appearance.

(2 marks)

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(Total marks 6)

5 a) An engineering drawing is drawn to a scale of 1:100. A line is drawn 10 mm long. What length would this be at full scale? (1 mark)

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b) CAD systems can be used to create 3D models of a product. Describe what **each** of the following tools does within a CAD model. (2 marks)

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ii) Revolve. (2 marks)

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c) A designer has 3D CAD models of three separate components. Explain how they can be assembled together into a single product using the CAD software. (3 marks)

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(Total marks 8)

6 a) Name **four** pieces of information that would be shown within the title block of an engineering drawing. (4 marks)

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b) Explain how a wiring diagram is different to a schematic diagram. (3 marks)

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c) Explain the purpose of **each** of the following types of drawing.  
i) Assembly. (2 marks)

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ii) Detail/component. (2 marks)

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iii) Block diagram. (2 marks)

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(Total marks 13)















