



1145-520 MAY 2018

Level 2 Technical Certificate in Engineering (360)

If provided, stick your candidate barcode label here.

**Friday 25 May 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.**

You should have the following for this examination

- non-programmable scientific calculator



1 a) State what is the meaning of a red safety sign. (1 mark)

b) State the shape of a safety sign used to show a warning. (1 mark)

(Total marks 2)

2 a) Describe what is meant by the 'tolerance' of a machined part. (2 marks)

b) Give **two** characteristics of quality assurance that are different from quality control. (2 marks)

(Total marks 4)

3 a) Name a hand tool that could be used to cut a 10 mm diameter bar of steel. (1 mark)

b) List **three** measuring instruments that could be used to measure the external diameter of a pipe. (3 marks)

(Total marks 4)

4 a) State **three** different types of stakeholder in an engineering company. (3 marks)

b) For **each**, name a different expectation that they may have of the company. (3 marks)
Complete the table below with your responses. The first line has been completed as an example.

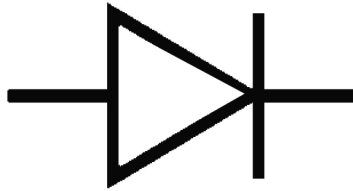
Stakeholder	Expectation
External shareholders	Dividend payment

(Total marks 6)

5 Identify the electrical components represented by the following symbols.

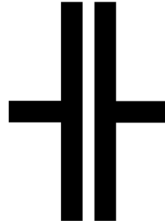
a)

(1 mark)



b)

(1 mark)



(Total marks 2)

6 Explain how implementing a 5S approach can improve the performance of an engineering business.

(4 marks)

(Total marks 4)



- 7 A company needs to manufacture a one-off part, Figure 1. This is a bracket used to reinforce the joint between **two** sides of a cupboard. It will be attached to the sides of the cupboard using screws.
- The maximum dimensions of the part are 150 mm x 50 mm, with a thickness of 5 mm. This will be made using a material chosen by the company.

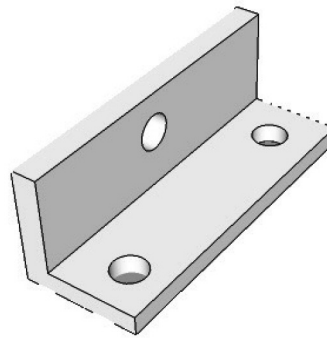


Figure 1

Suggest a suitable material to make the bracket. Give reasons for your suggestion and describe how the bracket will be made.

(6 marks)

(Total marks 6)



8 a) Describe what is meant by the scientific term 'moment', with reference to a force. (2 marks)

b) State the mechanical property of a material that allows it to return to its original shape after it has been deformed. (1 mark)

c) Describe what is meant by the term 'creep resistance'. (2 marks)

(Total marks 5)

9 a) Describe how a tensile test is carried out.

(4 marks)

b) Explain what is meant by galvanic corrosion and how this can be prevented.

(4 marks)

(Total marks 8)

10 A template is needed to mark out a batch of material, Figure 2. The shape is a rectangle with a triangle at the end.

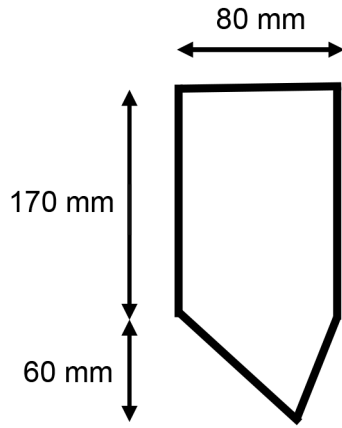


Figure 2 – NOT TO SCALE

Calculate the area of the template.

(5 marks)

(Total marks 5)

- 11 A class one lever is being used to raise a load of 80 N. The effort needed to move the load is 32 N.

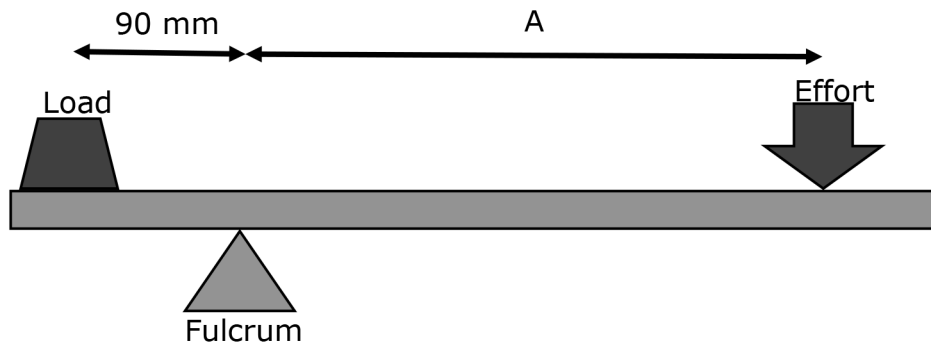


Figure 3

- a) Calculate the mechanical advantage. (2 marks)

- b) Calculate length A, the distance from the fulcrum at which the load was applied. (3 marks)

(Total marks 5)

12 A company is designing a wheelchair that will be used by an athlete for paralympic sports.
The wheelchair will be manufactured as a one-off to the individual requirements of the athlete.
Discuss which factors are **most** important when selecting the materials and manufacturing processes to make the wheelchair.

(9 marks)
