Rewarding Learning

Centre Number	
71	

Candidate Number

General Certificate of Secondary Education
2014

Engineering

Paper 1
Assessment Unit 3
assessing
Engineering Technology

[GEE31]

GEE31

FRIDAY 23 MAY, AFTERNOON

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all ten** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 80.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

For Examiner's use only	
Question Number	**Marks**
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
Total Marks	

Answer **all** questions.

Examiner Only	
Marks	Remark

1 **(a)** All the products below belong to a manufacturing sector.

Circle **two** products shown below that belong to the mechanical fabrication sector.

You **must** only circle **two** products. If you make a mistake you must clearly show which two products you have chosen.

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[2]

(b) All the products below belong to a manufacturing sector.

Circle **two** products shown below that belong to the engineering fabrication sector.

You **must** only circle **two** products. If you make a mistake you must clearly show which two products you have chosen.

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[2]

Examiner Only	
Marks	Remark

2 Answer all parts of this question in the spaces provided.

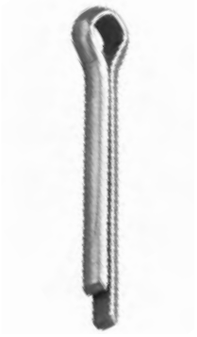
Question	Answer
(a) Name the tool shown. Give a use for it in an engineering workshop.  *Source: Supplied by author*	Name of tool _____ Use _____
(b) Identify the engineering component shown. Give a use for it in an engineering workshop.  *Source: Supplied by author*	Name _____ Use _____ _____
(c) Name the drill bit shown. Give a reason for its use.  *Source: Supplied by author*	Name _____ Reason _____ _____

[2]

[2]

[2]

Examiner Only	
Marks	Remark

(d) Identify the component shown. Give a use for it in an engineering workshop.  *Source: Supplied by author*	Name _____ Use _____ _____
(e) Identify the tool shown. Give a use for it in an engineering workshop.  *Source: Supplied by author*	Name _____ Use _____ _____

[2]

[2]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

3 **(a)** Using any **two** of the three pairs of material categories listed below, outline the differences between the two types of materials in the pair. You should include examples to support your answer.

- Hardwoods and softwoods
- Ferrous and non-ferrous metals
- Thermoplastics and thermosetting plastics

[4]

(b) Describe ductility, malleability and toughness as properties of metals.

Ductility

[2]

Malleability

[2]

Toughness

[2]

Examiner Only	
Marks	Remark

4 The pictures below show parts of a metal working lathe.

(a) Identify any **three** of the four lathe parts shown in the figures below. Show clearly which three figures you have chosen.

Fig. 1

Source: Supplied by author

Fig. 2

Source: Supplied by author

Fig. 3

Source: Supplied by author

Fig. 4

© Micro-Mark

1. _____ [1]

2. _____ [1]

3. _____ [1]

(b) Explain any **two** of the following in relation to machining. Show clearly which two you have chosen.

Chuck key **Swarf** **Feed** **Clearance angle**

1. _____

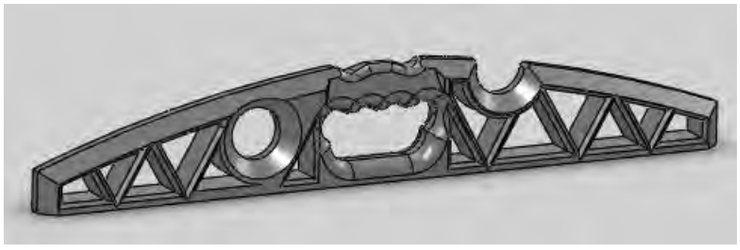
_____ [2]

2. _____

_____ [2]

Examiner Only	
Marks	Remark

5 The picture below shows a CAD drawing of a spirit level. CAM is used to manufacture the product using this drawing.



(a) What does the abbreviation CAM stand for?

_____

_____ [1]

(b) Outline **two** advantages of using CAD for the designer.

1. _____

_____ [2]

2. _____

_____ [2]

Examiner Only	
Marks	Remark

(c) CAD drawings can be downloaded to CNC machines such as the one shown below to enable the manufacture of products.

Source: Supplied by author

CNC machine

Source: Supplied by author

Spirit level manufactured using a CNC machine

Outline **one** advantage and **one** disadvantage of using CNC machines for the manufacturer.

Advantage

_____

_____ [2]

Disadvantage

_____

_____ [2]

Examiner Only	
Marks	Remark

6 The picture below shows a hinge made using a 3D printer.

Source: Supplied by author

The majority of engineering companies will produce prototypes to ensure that the quality of final products meets certain criteria.

(a) How do Quality Control and Quality Assurance differ?

_____

_____

_____

_____ [2]

(b) Outline **one** reason why it is important for an engineering company to ensure that quality assurance is carried out on their products.

_____

_____ [2]

(c) Identify **one** engineering product and describe how quality assurance has impacted on this product for the customer.

Product

_____

Impact of Quality Assurance

_____

_____ [2]

Examiner Only	
Marks	Remark

7 **(a)** With reference to the engineering sector, describe how modern materials have helped the design and development of engineered products.

Design

_____

_____

_____ [2]

Development

_____

_____

_____ [2]

(b) Outline **two** benefits for engineering companies of developing modern materials.

1. _____

_____ [2]

2. _____

_____ [2]

Examiner Only	
Marks	Remark

8 **(a)** Describe the following heat treatment processes.

(i) Etching

_____

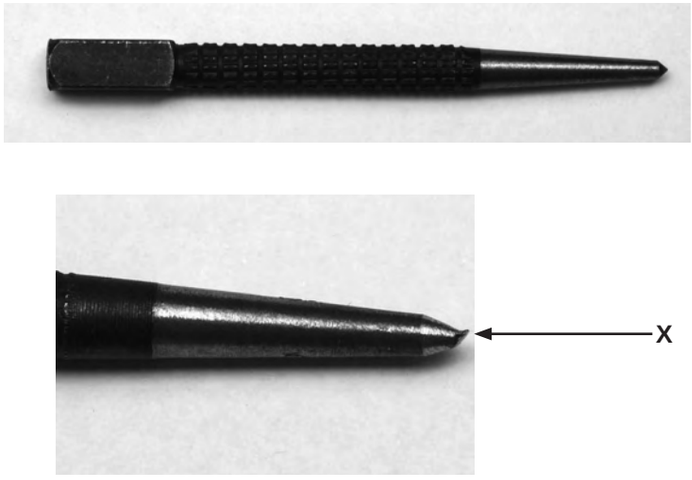
_____ [2]

(ii) Plating

_____

_____ [2]

(b) The centre punch shown below is used in the manufacture of engineered products.



Source: Supplied by author

(i) Outline **one** reason for the damage to the point of the centre punch shown at **X**.

_____

_____

_____ [2]

(ii) Explain **one** method to prevent damage to the point of a centre punch.

_____

_____

_____ [2]

(iii) State **one** safety precaution which should be observed when using water for cooling during heat treatment.

_____

_____ [2]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

9 The engineering sector incorporates a variety of manufacturing methods. One such method is the use of automation.

(a) Outline **two** benefits of using automation throughout the manufacturing process.

1. _____

_____ [2]

2. _____

_____ [2]

(b) Outline **two** disadvantages of automation within the manufacturing industry.

1. _____

_____ [2]

2. _____

_____ [2]

Examiner Only	
Marks	Remark

10 Health and safety issues are considered throughout the engineering sector in a variety of different ways.

(a) Explain, giving **two** examples, how health and safety issues have impacted on the manufacture of engineered products.

1. _____

_____ [2]

2. _____

_____ [2]

(b) Explain, giving **two** examples, how health and safety issues have impacted within an engineering firm, with specific reference to the workforce.

1. _____

_____ [2]

2. _____

_____ [2]

THIS IS THE END OF THE QUESTION PAPER

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