



General Certificate of Secondary Education
January 2014

Engineering
Paper 1
Assessment Unit 3
[GEE31]



THURSDAY 9 JANUARY, AFTERNOON

TIME

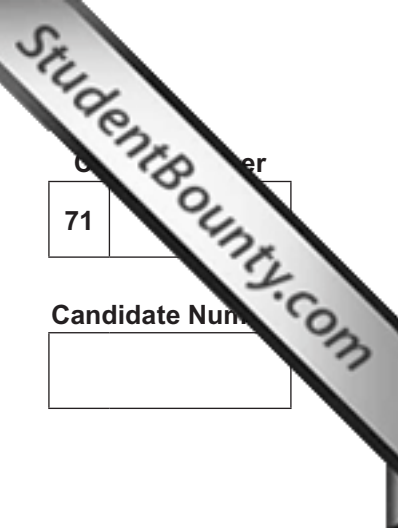
1 hour.

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.



Centre Number
71
Candidate Number

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



Answer **all** questions.

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]

Examiner Only	
Marks	Remark

(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.

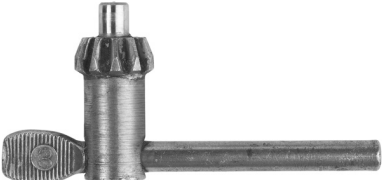
Examiner Only	
Marks	Remark

Question	Answer
<p>(a) Name the nut shown below. State one advantage for its use.</p>  <p>© iStockphoto / Thinkstock</p>	<p>Name _____</p> <p>Advantage _____</p> <p>_____</p> <p>_____</p>

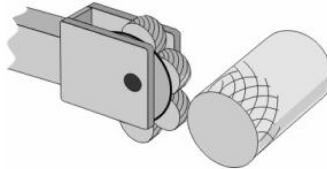
[2]

<p>(b) Name the clip shown. Give a suitable use for it.</p>  <p>© Arno Staub / iStock / Thinkstock</p>	<p>Name _____</p> <p>Use _____</p> <p>_____</p> <p>_____</p>
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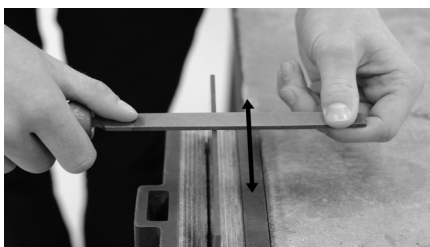
[2]

<p>(c) Name the tool shown below. State a use for it.</p>  <p>© PhotoObjects.net / Thinkstock</p>	<p>Name _____</p> <p>Use _____</p> <p>_____</p> <p>_____</p>
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[2]

<p>(d) Name the process used to create the pattern shown below. Give a suitable reason for its use.</p> 	<p>Process _____</p> <p>Reason _____</p> <p>_____</p> <p>_____</p>
--	--

[2]

<p>(e) Name the filing technique shown. State one advantage for its use.</p> 	<p>Filing technique _____</p> <p>_____</p> <p>Advantage _____</p> <p>_____</p> <p>_____</p>
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[2]

3 Computer Aided Manufacture (CAM) is widely used throughout the engineering sector.

(a) Outline **two** advantages of using CAM techniques in the production of high volume products.

1. _____
_____ [2]

2. _____
_____ [2]

(b) Give **one** example of a product manufactured by CAM and describe the CAM technique used in its manufacture.

Product
_____ [1]

CAM technique

_____ [2]

Examiner Only	
Marks	Remark

4 Smart materials have become a very important category of materials for designers and manufacturers in the engineering sector.

(a) Explain what is meant by the term smart material.

[2]

(b) Give **two** examples of smart materials and for **each** example identify an appropriate use.

Example

[1]

Use

[2]

Example

[1]

Use

[2]

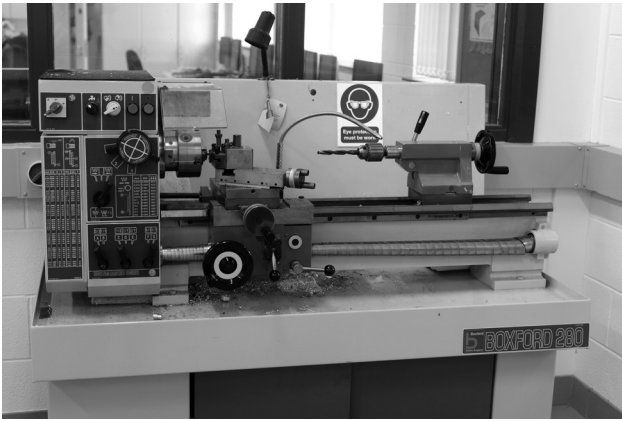
Examiner Only	
Marks	Remark

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(Questions continue overleaf)

5 The photographs below show two manually operated machines used in the manufacture of engineered products.

Examiner Only	
Marks	Remark



Machine A



Machine B

(a) Name each machine shown in the photographs above.

Machine A

[1]

Machine B

[1]

(b) Identify an example of a manufacturing procedure which could be carried out on each machine.

Machine A

[2]

Machine B

[2]

(c) Compare each machine shown opposite to its equivalent CNC machine. Outline **one** advantage for each machine. Both answers should be different.

Machine A – Advantage

[2]

Machine B – Advantage

[2]

Examiner Only	
Marks	Remark

6 Robotics like the one shown below are used extensively throughout the engineering industry.



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(a) Identify **one** disadvantage of using robotics in the engineering industry.

_____ [2]

(b) Identify **one** advantage of using robotics in the engineering industry.

_____ [2]

(c) Outline the advantages of using robotic control for **each** of the following engineering applications.

(i) Spray painting vehicle body parts.

_____ [2]

(ii) Testing gas pipes.

_____ [2]

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Marks	Remark

7 Communication between companies has become much easier due to advances in telecommunications. The majority of engineering companies now operate in a global market.

(a) Name **one** example of communications technology.

_____ [1]

(b) Outline **one** example of how communications technology has had an impact on the manufacture of engineered products.

_____ [2]

(c) Handling information and data is an essential feature in engineering companies.

Explain the benefits information and data handling systems have on:

(i) Production efficiency

_____ [2]

(ii) Marketing

_____ [2]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

8 (a) Explain any **two** of the following terms:

- Case hardening
- Annealing
- Work hardening

Term: _____

Explanation: _____

_____ [2]

Term: _____

Explanation: _____

_____ [2]

(b) The point of the chisel shown is hardened and tempered.



(i) Describe how tempering is carried out.

_____ [2]

(ii) Explain why it is important to temper the point of the chisel shown above.

 [2]

(c) Describe **one** safety precaution to be observed when heat treating the point of the chisel.

 [2]

Examiner Only	
Marks	Remark

9 Read the following paragraph and answer the questions that follow.

In the engineering sector, a measure of excellence or a state of being free from defects, can be brought about by the adherence to measurable and verifiable standards to achieve a uniformity of output. This helps satisfy consumer and user requirements. Quality control techniques used throughout the manufacture of products and the use of automation, enable this to happen.

(a) (i) Explain the term quality control.

[2]

(ii) Explain the term automation.

[2]

(b) (i) Pick a product of your choice from the engineering sector and describe how an engineering company would carry out a quality control check.

Product

Quality Control check

[2]

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Marks	Remark

(ii) Describe **one** advantage of quality control being carried out on an engineered product for the consumer.

[2]

Examiner Only	
Marks	Remark

10 New technologies have made an impact on engineering industries in different ways.

(a) With reference to the engineering industry identify **two** examples of how new technology has impacted on manufacturing efficiency.

[4]

(b) Outline the impact modern technology has on the range and availability of products throughout the engineering sector.

Range

[2]

Availability

[2]

THIS IS THE END OF THE QUESTION PAPER

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Marks	Remark

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