

OCR

Oxford Cambridge and RSA

Thursday 11 January 2018 – Afternoon**LEVEL 1/2 CAMBRIDGE NATIONAL IN ENGINEERING
MANUFACTURE****R109/01** Engineering materials, processes and production

Candidates answer on the Question Paper.

OCR supplied materials:

None

Other materials required:

None

Duration: 1 hour

Candidate forename		Candidate surname	
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Centre number						Candidate number				
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INSTRUCTIONS TO CANDIDATES

- Use black ink. HB pencil may be used for graphs and diagrams only.
- Complete the boxes above with your name, centre number and candidate number.
- Answer **all** the questions.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- Do **not** write in the barcodes.

INFORMATION FOR CANDIDATES

- The total number of marks for this paper is **60**.
- The number of marks for each question is given in brackets [] at the end of each question or part question.
- Dimensions are in millimetres unless stated otherwise.
- Your quality of written communication will be assessed in questions marked with an asterisk (*).
- This document consists of **12** pages. Any blank pages are indicated.

Answer **all** the questions.

1 A list of different types of engineering materials is given below.

- Alloys
- Composite materials
- Ferrous metals
- Non-ferrous metals
- Smart materials

(a) Choose **three** material types from the list and give **two** examples of each type.

Material type

Examples 1

2 [2]

Material type

Examples 1

2 [2]

Material type

Examples 1

2 [2]

(b) (i) Explain why thermoplastics are used for products more often than thermosetting plastics.

.....
.....
.....
.....
.....
.....
..... [3]

(ii) Give **one** example of a **product** made using thermosetting plastic.

..... [1]

2 (a) Give **one** example of a ceramic **material** that is used in engineered products.
..... [1]

(b) Ductility, elasticity and resistivity are three properties of engineering materials.
Describe what is meant by:
Ductility [2]
.....
.....

Elasticity [2]
.....
.....

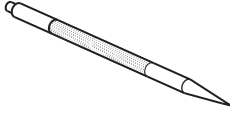
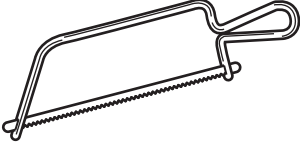
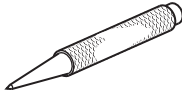
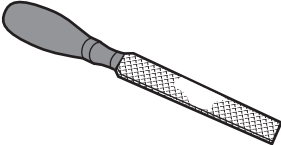
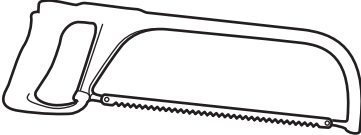
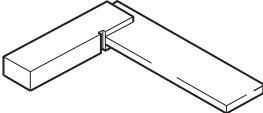
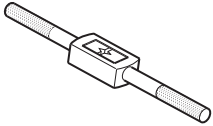
Resistivity [2]
.....
.....

(c) Name and describe **one** destructive test carried out on engineering materials.
Name [3]
.....
.....
.....

4

3 (a) Complete the table below by giving the correct name of each of the tools shown.

One has been done for you.

Tool	Name of tool
	Scriber
	
	
	
	
	
	

[6]

(b) Riveting is a joining process that does not involve the use of heat.

(i) Describe how two sheet metal parts would be joined using 3mm countersunk rivets.

.....
.....
.....
.....
.....
..... [3]

(ii) Name **one** other joining process that does not involve the use of heat.

..... [1]

4 Engineered products often have surface finishes applied to them after manufacture.

(a) Give **three** surface finishing processes suitable for use on mild steel parts.

- 1
- 2
- 3 [3]

(b) Risk assessments are carried out to ensure safety during engineering processes.

Give **three** stages in carrying out a risk assessment of an engineering process.

- 1
.....
- 2
.....
- 3
..... [3]

(c) Centre lathes are manually operated machines used to produce turned parts.

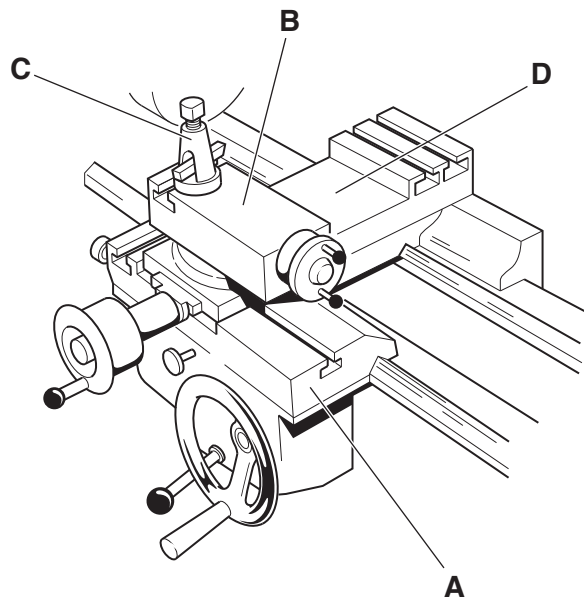


Fig. 1

Fig. 1 shows the parts of a centre lathe that control the cutting tool.

Name the four parts of the centre lathe labelled in Fig. 1.

- A
- B
- C
- D

[4]

(b) Describe how CNC machining might be used in the development of new engineered products.

.....
.....
.....
.....
.....
.....
..... [3]

(c) Give **one** example of an additive manufacturing process.

..... [1]

6 (a) Describe **three** benefits to a manufacturer of using automation in the production of engineered products.

1
.....
.....
..... [2]

2
.....
.....
..... [2]

3
.....
.....
..... [2]

(b) Explain the benefits and drawbacks of the Just-in-Time (JIT) method of manufacture.

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.....
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.....
.....
..... [4]

END OF QUESTION PAPER

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