



Oxford Cambridge and RSA

**Wednesday 24 May 2017 – Morning**

**GCSE ENGINEERING**

**A622/02 Engineering Processes**

\* 6 6 7 0 1 6 6 6 6 4 4 \*

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**

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Write your answer to each question in the space provided. If additional space is required, you should use the lined page(s) at the end of this booklet. The question number(s) must be clearly shown.
- Do **not** write in the barcodes.

**INFORMATION FOR CANDIDATES**

- The number of marks is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this paper is **60**.
- 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.

1 Engineering sectors make different products.

(a) (i) Complete the table below by naming **three** engineering sectors and giving **one** example of a product made in each sector.  
The first one has been done for you.

Sector	Product
Medical and Pharmaceutical	Heart monitor

[6]

(ii) Choose **one** of the sectors from the table and give **two** more examples of products made in that sector.

Sector .....

Product 1 .....

Product 2 .....

[2]

2 The list below gives different types of engineering materials.

**Ceramics**  
**Composites**  
**Ferrous alloys**  
**Non-ferrous alloys**  
**Polymers**

(a) Complete the table below by giving the names of **two** ferrous alloys, **two** non-ferrous alloys and **two** polymers.

	<b>Ferrous alloys</b>	<b>Non-ferrous alloys</b>	<b>Polymers</b>
<b>Example 1</b>			
<b>Example 2</b>			

[6]

(b) Explain what is meant by the term 'alloy'.

.....  
.....

[2]

(c) Name **one** ceramic material.

.....

[1]

(d) Place a tick (✓) to show which of the materials below is a composite material.

<b>Iron</b>	<b>Carbon fibre</b>	<b>Nylon</b>	<b>Titanium</b>

[1]

3 Fig. 1 shows a bench drilling machine.

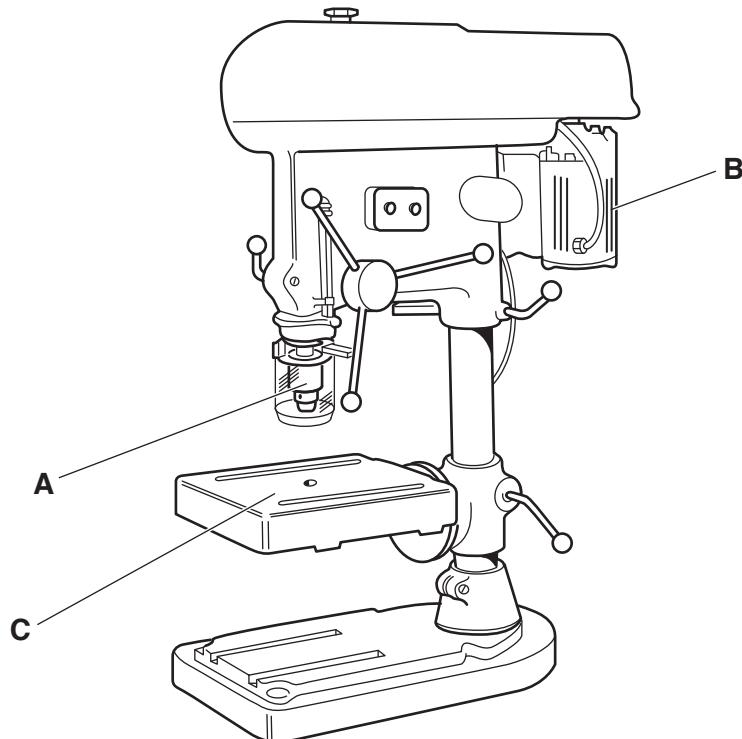


Fig. 1

(a) Name the **three** parts of the drilling machine that have been labelled in Fig. 1.

A .....

B .....

C .....

[3]

(b) Describe **two** safety precautions, other than using Personal Protective Equipment (PPE), that should be taken when using a drilling machine.

1 .....

.....

2 .....

.....

[4]

4 The list below gives different types of engineering processes.

**Heat and chemical treatment**  
**Joining and assembly**  
**Material removal**  
**Shaping and manipulation**  
**Surface finishing**

(a) Complete the table below by giving **two** examples of each of the process types given.

The first row has been done for you.

Process type	Examples	
<b>Shaping and manipulation</b>	Extrusion	Injection moulding
<b>Heat and chemical treatment</b>		
<b>Surface finishing</b>		

[4]

(b) Give **two** items of Personal Protective Equipment (PPE) that should be used when carrying out material removal processes.

1 .....

2 .....

[2]

5 Fig. 2 shows a number of engineering components.

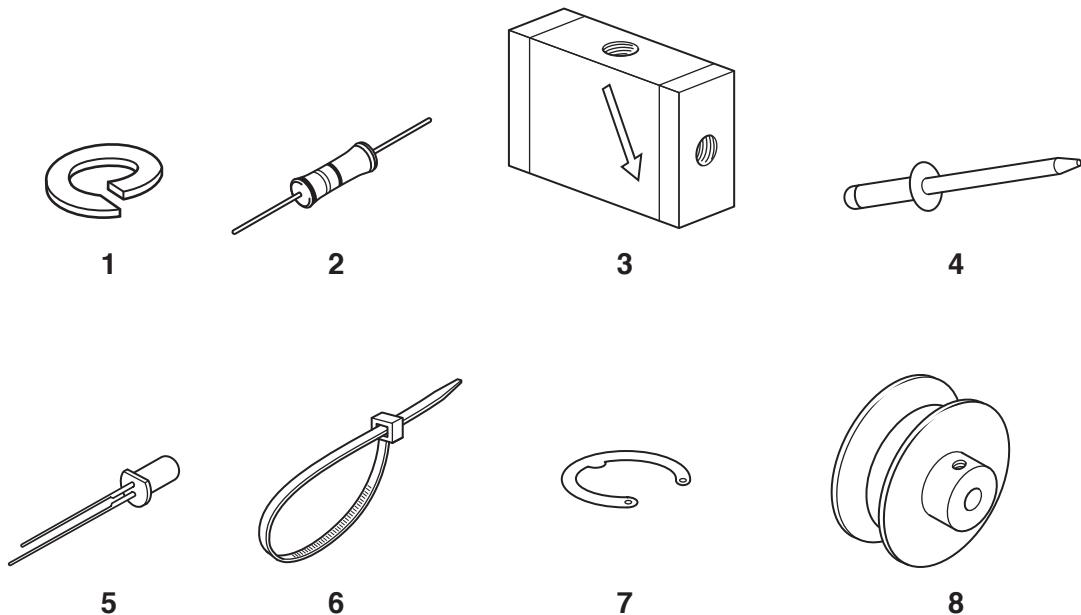


Fig. 2

Choose **three** components from Fig. 2 and, for each one, give:

- The name of the component
- An example of its use

One has been done for you.

Component number ..... 7

Name of component ..... Circlip

Example of use ..... The circlip is clipped into a groove on a shaft to stop a gear or a wheel from sliding along it when it's in use.

.....

Component number .....

Name of component ..... [1]

Example of use .....

.....

[2]

Component number .....

Name of component ..... [1]

Example of use .....

..... [2]

Component number .....

Name of component ..... [1]

Example of use .....

..... [2]

6 (a) Describe what is meant by the term 'sampling' in quality control.

.....  
.....  
.....  
.....

[2]

(b) Describe **one** use of a modern technology in quality control.

.....  
.....  
.....  
.....

[2]

(c) Explain the importance to manufacturers of using quality control techniques.

.....  
.....  
.....  
.....  
.....  
.....  
.....

[3]

7 Modern technologies are often used during the stages in manufacturing engineered products.

(a) Explain how modern technology might be used when designing new products.

.....  
.....  
.....  
.....  
.....

[3]

(b) Describe **two** ways of using modern technologies in packaging and dispatch.

1 .....

.....  
.....  
.....  
.....

2 .....

.....  
.....  
.....  
.....

[4]

10

**8\*** Discuss the advantages and disadvantages that the use of modern technology has brought to society.

**END OF QUESTION PAPER**

**ADDITIONAL ANSWER SPACE**

If additional space is required, you should use the following lined page(s). The question number(s) must be clearly shown in the margin(s).



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