OCR
Oxford Cambridge and RSA

Tuesday 19 May 2015 – Morning

GCSE ENGINEERING

A622/02 Engineering Processes

Candidates answer on the Question Paper.

OCR supplied materials:
None

Other materials required:
None

Duration: 1 hour

Candidate forename		Candidate surname	

Centre number						Candidate number				

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. 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 bar codes.

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 produce different products.

(a) Name **three** engineering sectors.

1 .....

2 .....

3 .....

[3]

(b) Choose **two** of the sectors you have named in part **(a)**.
For each sector, give **two** examples of products made in the sector.

Sector .....

Product 1 .....

Product 2 .....

[2]

Sector .....

Product 1 .....

Product 2 .....

[2]

2 The list below shows a number of metals used in engineering.

Aluminium	**Mild steel**
Brass	**Stainless steel**
Bronze	**Tin**
Cast iron	**Titanium**
Copper	**Zinc**

(a) (i) Give **three** metals from the list that are alloys.

1 .....

2 .....

3 .....

[3]

(ii) Give **two** metals from the list that are ferrous metals.

1 .....

2 .....

[2]

(b) Explain why stainless steel is often used to make food preparation products.

.....

.....

.....

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

3 There are three different types of engineering components:

Mechanical
Electrical/electronic
Pneumatic/hydraulic

(a) (i) Complete the table below by giving the names of the **three** mechanical components shown.

Component	Name of component
	
	
	

[3]

(ii) Describe the function of **one** of the mechanical components shown in the table.

Component .....

.....

.....

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

(b) Give **two** examples of electrical/electronic components.

1 .....

2 .....
[2]

(c) Give **one** example of a pneumatic/hydraulic component.

..... **[1]**

4 Fig. 1 shows a toolmaker's clamp and one of the jaws from it.
The jaw is made from 16 mm × 16 mm mild steel bar.

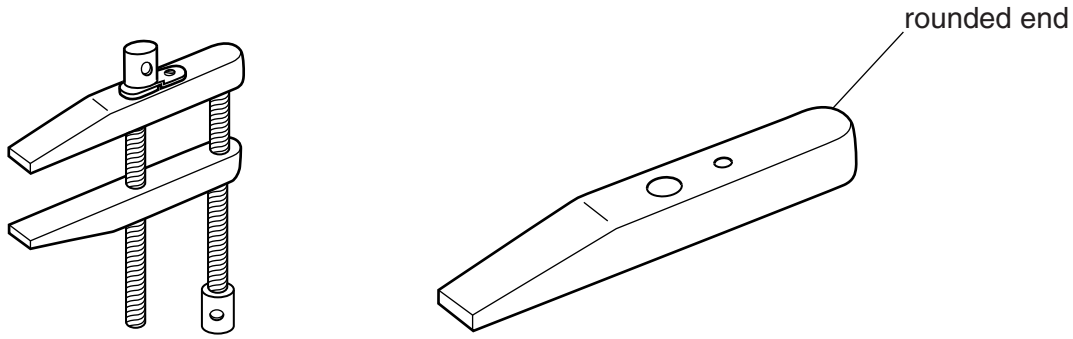

Fig. 1

(a) Give **two** reasons why mild steel is a suitable material for making the jaw.

1 .....

2 .....
[2]

(b) The sloping face on the jaw is produced on a milling machine.

Give **three** safety precautions that should be taken when using a milling machine.

1 .....

2 .....

3 .....
[3]

(c) Complete the table below to show the stages needed to produce the rounded end of the jaw shown in Fig. 1. Name the tools used at each stage.
The first and last stages have been done for you.

	Stage	**Tools used**
1	Mark out the shape of the curve	Dividers and dot punch
2		
3		
4	Remove sharp edges from the finished curve	Sanding block with emery cloth

[4]

5 The list below shows different types of engineering processes.

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

(a) (i) Give **two** specific examples of shaping and manipulation processes.

Example 1 .....

Example 2 .....
[2]

(ii) Give **two** specific examples of joining and assembly processes.

Example 1 .....

Example 2 .....
[2]

(b) Choose **one** of the processes you have given in part **(a)**.

Process .....

Give **two** safety precautions, other than using Personal Protective Equipment (PPE), that must be taken when carrying out the process.

1 .....

2 .....
[2]

(c) Explain the quality control checks that should be made before using a surface finishing process on a product.

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.....

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.....

.....

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

6 The list below shows stages in the design of an engineered product.

Producing a design specification
Generating design solutions
Presenting design solutions to the client
Developing final design
Creating engineering drawings for manufacture

(a) Choose **two** of the stages from the list. Describe what takes place at each stage.

1. Stage .....

.....

.....

.....

.....

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

2. Stage .....

.....

.....

.....

.....

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

(b) Explain how modern technologies could be used when presenting design solutions to a client.

.....

.....

.....

.....

.....

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

7 **(a)** Describe **two** ways in which modern technologies have improved safety for workers in factories.

1 .....

.....

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

2 .....

.....

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

(b) Explain the importance of workforce training in modern engineering industries.

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

8* Discuss the issues involved in the disposal of engineered products at the end of their useful life.

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..... **[6]**

END OF QUESTION PAPER

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