

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS
GCSE**

A622/02

ENGINEERING

Engineering Processes

TUESDAY 19 MAY 2015: Morning

DURATION: 1 hour

plus your additional time allowance

MODIFIED ENLARGED

Candidate forename		Candidate surname	
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Centre number						Candidate number				
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Candidates answer on the Question Paper.

OCR SUPPLIED MATERIALS:

None

OTHER MATERIALS REQUIRED:

None

READ INSTRUCTIONS OVERLEAF

INSTRUCTIONS TO CANDIDATES

Write your name, centre number and candidate number in the boxes on the first page. 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).

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 (*).

Any blank pages are indicated.

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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]**

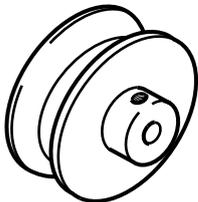
3 There are three different types of engineering components:

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 _____

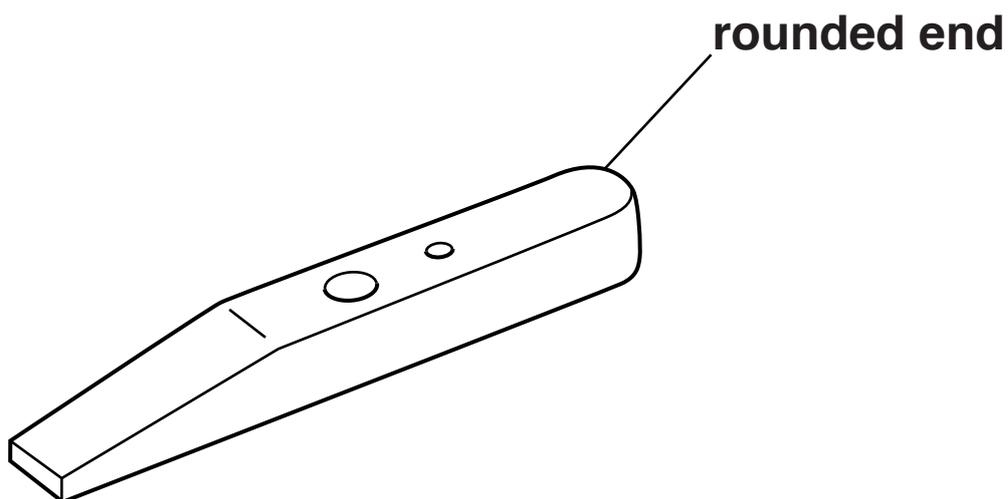
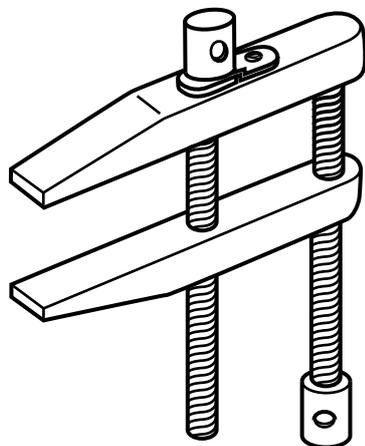
[2]

(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.

[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.

_____ [3]

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