



Oxford Cambridge and RSA

Tuesday 24 May 2016 – 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	
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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. 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 A list of engineering sectors is given below.

Aerospace	Electrical and Electronics
Automotive	Medical and Pharmaceutical
Chemical and Process	Rail and Marine
Computers, Communication and IT	Structural and Civil

(a) Complete the table by stating which engineering sector makes the products given.

Product	Engineering sector
Paint	
Wheelchair	
Microwave oven	
Disc brake	
Mobile phone	

[5]

(b) Choose **one** of the sectors you have given in part (a) and give **two** other products made in that sector.

Sector

Product 1

Product 2

[2]

2 Fig. 1 shows a clamping plate made in a school workshop from 5 mm thick mild steel.

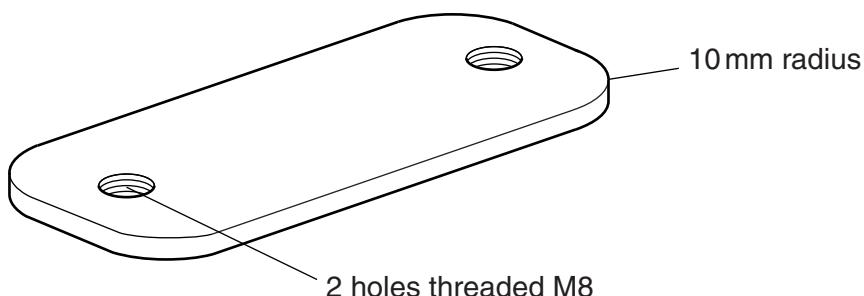


Fig. 1

(a) (i) Complete the list below to give the stages needed to make the clamping plate shown in Fig. 1.

Stage 1 Cut the steel and file it to size

Stage 2

Stage 3 Cut and file the curves on the corners of the plate

Stage 4

Stage 5 Cut the M8 threads in the holes

Stage 6

[3]

(ii) Name **two** tools needed to cut the M8 threads in the holes.

1

2

[2]

(b) The clamping plate shown in Fig. 1 is to be made in large quantities.

Name **two** industrial processes which could be used to cut the shape of the clamping plate.

1

2

[2]

3 The list below shows a number of engineering materials.

ABS	Glass
Aluminium	GRP
Bronze	High speed steel
Cast iron	Nylon
Concrete	Tungsten carbide

(a) Select a suitable material from the list to complete the following statements:

(i) is a ferrous metal. [1]

(ii) is a polymer. [1]

(iii) is an alloy. [1]

(iv) is a ceramic. [1]

(v) is a composite. [1]

(b) Explain, using **one** example, what is meant by the term 'non-ferrous alloy'.

4 Drilling is a material removal process.

(a) (i) Name **one** item of Personal Protective Equipment (PPE) that should be used when operating a drilling machine.

..... [1]

(ii) Give **two** safety precautions, other than PPE, that should be taken when operating a drilling machine.

1

2

[2]

(b) Welding is a joining and assembly process.

(i) Name **three** other joining and assembly processes.

1

2

3

[3]

(ii) Choose **one** of the processes you have given in part (b)(i) and name **two** tools or items of equipment used in the process.

Process

Tools/items of equipment

1

2

[2]

(c) Many engineering processes are carried out on CNC machines.

State what the letters CNC stand for.

C N C [1]

5 The list below gives some stages in the design of an engineered product.

Client brief
Modifying designs
Prototyping
Research

(a) Describe what takes place in any **two** of these stages.

1 Name of design stage

Description

.....

.....

.....

[2]

2 Name of design stage

Description

.....

.....

.....

[2]

(b) Explain how information, communications and digital technologies can be used when designing engineered products.

.....

.....

.....

.....

.....

[3]

6 A list of different types of engineering components is given below.

Mechanical
Electrical/electronic
Pneumatic/hydraulic

(a) Name **one** mechanical component and describe **one** example of its use.

Component [1]

Example of use
.....
.....

[2]

(b) Name **one** electrical/electronic component and describe **one** example of its use.

Component [1]

Example of use
.....
.....

[2]

(c) Name **one** pneumatic/hydraulic component and describe **one** example of its use.

Component [1]

Example of use
.....
.....

[2]

7 'Sampling' is a technique used in quality control.

(a) Explain how sampling is carried out in quality control.

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

[3]

(b) Describe **two** possible effects of not carrying out quality control.

1

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

[2]

2

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

[2]

8* Discuss the possible benefits to the environment of using modern technologies.

[6]

END OF QUESTION PAPER

10

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