

OCR

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 hourCandidate
forenameCandidate
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.

2

- 1 A list of engineering sectors is given below.

Aerospace
Automotive
Chemical and Process
Computers, Communication and IT

Electrical and Electronics
Medical and Pharmaceutical
Rail and Marine
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]

3

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

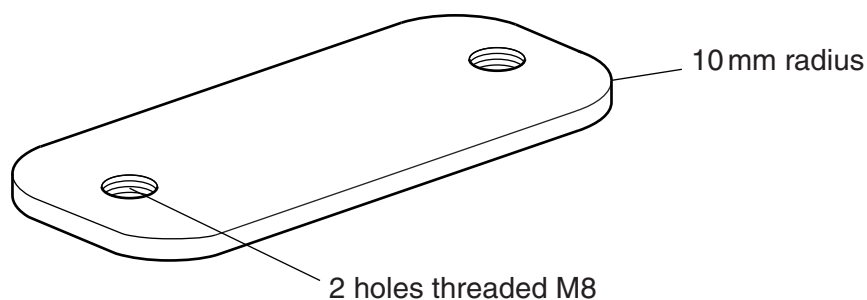


Fig. 1

- (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'.

.....

.....

.....

.....

.....

..... [3]

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.

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..... [6]

END OF QUESTION PAPER

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