

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 numb | er | | | Candidate nu | ımber | | |

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.



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] |

Mild steel

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

Aluminium

| | | Brass Bronze Cast iron Copper | Tin Titanium Zinc | |
|-----|------|-------------------------------|--|-----|
| (a) | (i) | Give three metals from | the list that are alloys. | |
| | | 1 | | |
| | | 2 | | |
| | | 3 | | |
| | | | | [3] |
| | (ii) | Give two metals from t | he list that are ferrous metals. | |
| | | 1 | | |
| | | 2 | | |
| | | | | [2] |
| (b) | Exp | lain 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

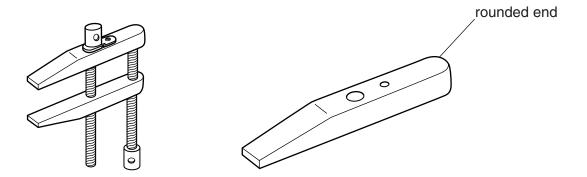
(a) (i) Complete the table below by giving the names of the **three** mechanical components shown.

| Component | Name of component |
|-----------|-------------------|
| | |
| | |
| | |

| | (ii) | Describe the function of one of the mechanical components shown in the table. | |
|-----|------|--|-------|
| | | Component | |
| | | | |
| | | | |
| | | | . [2] |
| (b) | Give | e two examples of electrical/electronic components. | |
| | 1 | | |
| | 2 | | |
| | | | [2] |
| (c) | Give | e one example of a pneumatic/hydraulic component. | |
| | | | [1] |

[3]

Fig. 1 shows a toolmaker's clamp and one of the jaws from it. The jaw is made from $16 \, \text{mm} \times 16 \, \text{mm}$ mild steel bar.



| | Fig. 1 | |
|-----|---|----|
| (a) | Give two reasons why mild steel is a suitable material for making the jaw. | |
| | 1 | |
| | 2 | [2 |
| | | L2 |
| (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) | Cho | pose one of the processes you have given in part (a) . |
| | Pro | cess |
| | | e two safety precautions, other than using Personal Protective Equipment (PPE), that is to be taken when carrying out the process. |
| | 1 | |
| | 2 | |
| | | [2] |
| (c) | - | plain the quality control checks that should be made before using a surface finishing cess 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 |
| | |
| | |
| | |
| | [c] |
| | 2. Stage |
| | 2. Gago |
| | |
| | |
| | |
| | [2] |
| (b) | Explain how modern technologies could be used when presenting design solutions to a client |
| | |
| | |
| | |
| | |
| | [3] |
| | [3] |

| 7 | (a) | Describe two ways in which modern technologies have improved safety for worke factories. | rs in |
|---|-----|---|-------|
| | | 1 | |
| | | | |
| | | 0 | |
| | | 2 | |
| | | | |
| | (b) | Explain the importance of workforce training in modern engineering industries. | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | [2] |

| Discuss the issues involved in the disposal of engineered products at the end of their useful life. |
|---|
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| [6] |

END OF QUESTION PAPER

10 BLANK PAGE

PLEASE DO NOT WRITE ON THIS PAGE

11 BLANK PAGE

PLEASE DO NOT WRITE ON THIS PAGE

12

BLANK PAGE

PLEASE DO NOT WRITE ON THIS PAGE



Copyright Information

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact the Copyright Team, First Floor, 9 Hills Road, Cambridge CB2 1GE.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.

© OCR 2015