

Monday 14 May 2012 – Afternoon

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

MODIFIED LANGUAGE

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) Complete the links below to identify which engineering sector makes each product listed.

Engineering Sector		Product
Medical and Pharmaceutical	—	Flood barrier
Computers Communications and IT	—	Paint stripper
Structural and Civil	—	Inhaler
Chemical and Process	—	Webcam

[4]

(b) State **two** engineering sectors different to those shown above.
Name **one** product made in each sector.

Sector 1 **[1]**

Product **[1]**

Sector 2 **[1]**

Product **[1]**

- 2 (a) Tick (✓) **two** items of personal protective equipment (PPE) that should be used when using a soldering iron.

<input type="checkbox"/>	overalls/apron
<input type="checkbox"/>	hard hat
<input type="checkbox"/>	high visibility jacket
<input type="checkbox"/>	safety goggles

[2]

- (b) Describe **two** safety precautions, other than PPE, that should be taken when using a soldering iron.

1

.....

..... [2]

2

.....

..... [2]

- (c) Give **two** checks that would be carried out during manufacture to make sure that engineered components meet the specified tolerance.

1

..... [1]

2

..... [1]

3 The list below shows a number of engineering materials.

phosphor bronze
copper
ABS

glass
concrete

(a) Select a suitable material from the list to complete each of the following statements correctly.

- (i)** is an alloy [1]
- (ii)** is a polymer [1]
- (iii)** is a non-ferrous metal [1]
- (iv)** is a composite [1]

(b) Explain the meaning of the term 'alloy.'

.....

.....

..... [2]

(c) Explain the meaning of the term 'composite'.

.....

.....

..... [2]

- 4 (a) Name **one** stage in the manufacture of an engineered product.

..... [1]

- (b) Describe **one** quality control technique used in engineering.

.....

.....

..... [2]

- (c) Give **two** factors that should be considered when selecting finishing processes for an engineered product.

1

..... [1]

2

..... [1]

- (d) Give **two** benefits to a company when health and safety procedures are followed.

1

..... [1]

2

..... [1]

5 (a) Complete the table below by giving **one** example of each of the engineering processes listed.

Engineering Process	Example of engineering process
Joining[1]
Assembling[1]
Heat treatment[1]
Chemical treatment[1]

(b) (i) Describe, using an example, **one** benefit of using 'modern materials' in engineering products.

.....

 [2]

(ii) Describe, using an example, one benefit of using 'smart materials' in engineered products.

.....

 [2]

- 6 Explain the function of any **three** of the engineering components listed below.
Give **one** example of the use of each component.

- | | |
|-----------------------|-------------------------------|
| a. chain drive | d. light emitting diode (LED) |
| b. cold rivet | e. potentiometer |
| c. flow control valve | f. transistor |

(i) Component 1

Function

..... [2]

Example of use

..... [1]

(ii) Component 2

Function

..... [2]

Example of use

..... [1]

(iii) Component 3

Function

..... [2]

Example of use

..... [1]

- 7 The table below shows a comparison of six materials that could be used to make an engineered product.

Material	Factors to be considered				
	Ease of storage	Safe to use	Ease of handling	Value for money	Availability
A	2	8	7	3	5
B	3	4	8	9	7
C	2	4	1	6	3
D	3	9	6	5	6
E	7	2	1	3	6
F	2	5	4	6	3

10 = excellent and 1 = very poor

- (a) State which material is the best value for money [1]

- (b) Give **two** reasons why material **C** would be least suited for the manufacture of a prototype product.

1

..... [1]

2

..... [1]

- (c) Explain how the information in the table could be used to identify the best material to buy in bulk.

.....

.....

.....

..... [3]

8* Discuss the impact of the introduction of modern technology on the quality of engineered products.

..... [6]

10
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11
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