OCR
RECOGNISING ACHIEVEMENT

Monday 14 May 2012 – Afternoon

GCSE ENGINEERING

A622/02 Engineering Processes

A622810612

Candidates answer on the Question Paper.

OCR supplied materials:
None

Other materials required:
None

Duration: 1 hour

A622202

Candidate forename		Candidate 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.

1 Engineering sectors produce different products.

(a) Complete the links below to identify which engineering sector makes the products 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.

- ☐ overalls/apron
- ☐ hard hat
- ☐ high visibility jacket
- ☐ 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 ensure that engineered components meet the specified tolerance.

1 .....

..... **[1]**

2 .....

..... **[1]**

3 The list below shows a number of engineering materials.

phosphor bronze	**glass**
copper	**concrete**
ABS	

(a) Select a suitable material from the list to complete 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 an 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.

	Factors to be considered				
Material	**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.

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..... **[6]**

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