OCR
RECOGNISING ACHIEVEMENT

Tuesday 24 January 2012 – Afternoon

GCSE ENGINEERING

A622/02 Engineering Processes

A622802

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
Aerospace	—	Wheelchair
Automotive	—	Guided missiles
Medical and Pharmaceutical	—	Level crossing barriers
Rail and Marine	—	Airbags

[4]

(b) Complete the table below to name **three** engineering sectors **different** to those shown above. For each sector, identify **one** product produced in that sector.

Engineering Sector	Product

[2]

[2]

[2]

2 **(a)** Tick (✓) **two** items of personal protective equipment (PPE) that should be used when operating a centre lathe.

- ☐ safety glasses
- ☐ darkened glass face mask
- ☐ safety helmet
- ☐ overalls/apron

[2]

(b) Describe **two** safety precautions, other than PPE, that should be taken when operating a centre lathe.

1 .....

.....

..... **[2]**

2 .....

.....

..... **[2]**

(c) Describe how you would use **one** piece of measuring equipment to measure small components produced on a centre lathe.

.....

.....

..... **[2]**

3 The list below shows a number of engineering materials:

brass
mild steel
PVC
oak
tungsten carbide

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

(i) ..... is a polymer **[1]**

(ii) ..... is a ceramic **[1]**

(iii) ..... is a ferrous metal **[1]**

(iv) ..... is an alloy **[1]**

(b) (i) Explain why mild steel would not be commonly used to make a small boat.

.....

.....

.....

..... **[3]**

(ii) Name **two** alternative materials that might be more suitable for making small boats.

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

2 ..... **[1]**

4 **(a)** Describe how 'information, communications and digital technologies' can be used during the following stages of the manufacture of an engineered product.

(i) Marketing .....

.....

..... **[2]**

(ii) Production planning .....

.....

..... **[2]**

(b) Describe **one** benefit of using digital communication over other methods of communication.

.....

.....

..... **[2]**

5 Electro-plating is a commonly used surface finishing process.

(a) Explain, using **one** example, why some materials are electro-plated.

.....

.....

.....

..... **[3]**

(b) **(i)** Describe **one** check that would be carried out **before** surface finishing a material.

.....

.....

..... **[2]**

(ii) Describe **one** quality check that would be carried out **after** a surface finishing operation.

.....

.....

..... **[2]**

6 Explain the function of any **three** of the engineering components listed below:

a. fuse	**d. single acting cylinder**
b. pulley	**e. spring**
c. relay	**f. switch**

(i) Component 1 .....

Function .....

.....

.....

..... **[2]**

(ii) Component 2 .....

Function .....

.....

.....

..... **[2]**

(iii) Component 3 .....

Function .....

.....

.....

..... **[2]**

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**	**Machinability**	**Ease of handling**	**Value for money**	**Availability**
A	3	4	3	6	3
B	3	2	5	4	6
C	2	9	7	3	8
D	8	4	9	7	7
E	6	2	1	3	4
F	9	5	4	8	8

10 = excellent and 1 = very poor

(a) (i) State which material would be the most difficult to store.

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

(ii) State which material would be most difficult to unload.

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

(b) Give **two** reasons why material **F** would be the most suitable material for an engineering company that produces large batches of components at short notice.

1 .....

.....

2 .....

..... **[2]**

(c) When selecting materials for engineered products, factors other than those listed in the table would need to be considered.

State **one** other factor that would need to be considered, and explain why this factor is important.

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

Importance .....

.....

.....

..... **[3]**

8* Discuss the impact that modern technology has on the environment.

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

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