

GENERAL CERTIFICATE OF SECONDARY EDUCATION
ENGINEERING
Engineering Processes

A622

Candidates answer on the question paper.

OCR supplied materials:
None

Other materials required:
None

Monday 16 May 2011
Afternoon

Duration: 1 hour



Candidate forename		Candidate surname	
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Centre number						Candidate number				
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INSTRUCTIONS TO CANDIDATES

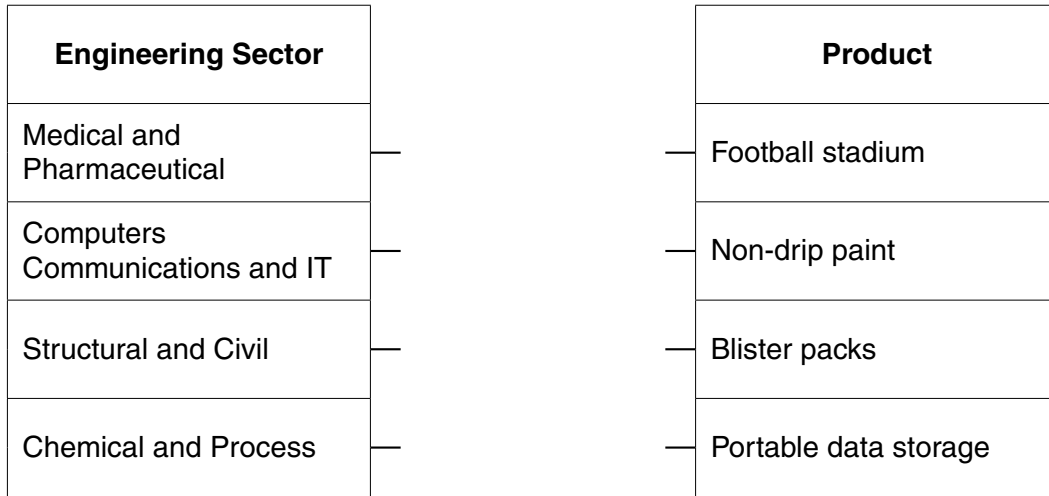
- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Write your answer 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).
- Answer **all** the questions.
- 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 is 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.



[4]

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

1 Sector [1]

Product [1]

2 Sector [1]

Product [1]

2 (a) Tick (✓) **two** items of personal protective equipment (PPE) that you should use when operating a grinding machine.

- darkened glass face mask
- hard hat
- overalls
- safety visor

[2]

(b) Describe **two** safety 'precautions' other than 'PPE' that you should take when operating a grinding machine.

1

.....

..... [2]

2

.....

..... [2]

(c) It is important to ensure that a finished product meets the design specification.

Give **two** checks that would be made on a finished product to ensure that it meets the design specification.

1

..... [1]

2

..... [1]

3 The list below shows a number of engineering materials.

brass	duralumin
glass	MDF
medium carbon steel	PVC

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

(i) is an alloy [1]

(ii) is a polymer [1]

(iii) is a ferrous material [1]

(iv) is a non-ferrous material [1]

(v) is a composite [1]

(b) State what is meant by the term 'ferrous.'

.....
 [1]

(c) Name **two** ferrous metals, other than the one named in part (a), that are commonly used in the engineering industry.

1 [1]

2 [1]

4 Robotic technology is increasingly being used by engineering industries.

(a) Give **one** example of an engineered product that is produced using robots.

..... [1]

(b) Describe **one** way in which robots may be used when making an engineered product.

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

(c) Give **two** benefits to an engineering company of using robotics when making an engineered product.

1
..... [1]

2
..... [1]

(d) Give **two** disadvantages to an engineering company of using robotics when making an engineered product.

1
..... [1]

2
..... [1]

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

Engineering Process	Example of Engineering processes
Shaping and Manipulation [1]
 [1]
Surface finishing [1]
 [1]

(b) Describe **two** benefits of using information, communication and digital technologies in the supply of engineering components.

1

 [2]

2

 [2]

6 Explain, using sketches and/or notes, the function of any **three** of the engineering components listed below.

Give **one** example of each component chosen.

filter
pop rivet
single acting cylinder

light dependent resistor (LDR)
potentiometer
spring

(i) Component 1

Function

.....

.....

[2]

Example

.....

[1]

(ii) Component 2

Function

.....

.....

[2]

Example

.....

[1]

(iii) Component 3

Function

.....

.....

[2]

Example

.....

[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 safest to use. [1]

(b) Give **two** reasons why material **B** would be best 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 for the **workforce** to use.

..... [3]

8* Discuss the impact of modern technology on the range of engineered products available.

.....

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..... [6]

10
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