



GENERAL CERTIFICATE OF SECONDARY EDUCATION
ENGINEERING
 Engineering Processes

A622

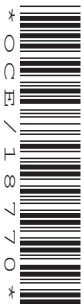
Candidates answer on the Question Paper

OCR Supplied Materials:
None

Other Materials Required:
None

Monday 17 May 2010
Afternoon

Duration: 1 hour



Candidate Forename		Candidate Surname	
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Centre Number						Candidate Number				
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INSTRUCTIONS TO CANDIDATES

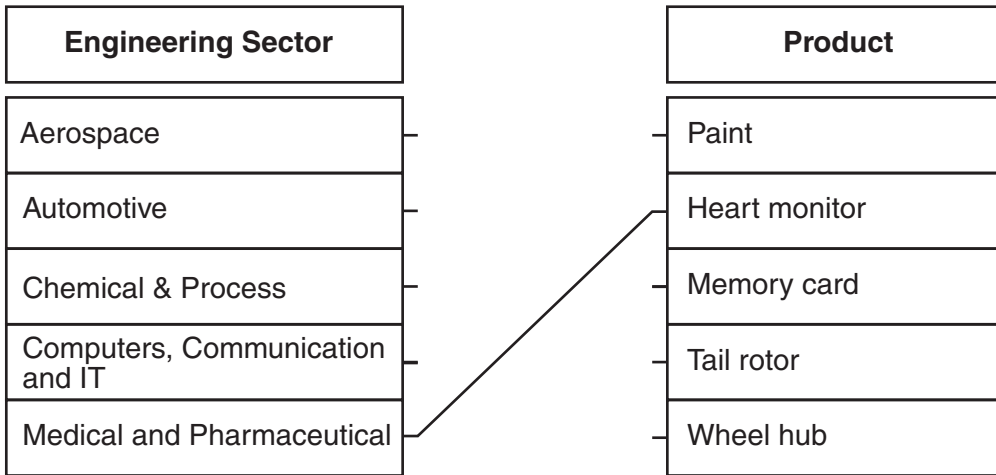
- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- 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).

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. One has been done for you.



[4]

(b) State **two** engineering sectors different from those given above and, for each sector, give **one different** product made in that sector.

Sector: [1]

Product: [1]

Sector: [1]

Product: [1]

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

Goggles

Safety helmet

Gloves

Apron

[2]

(b) Describe **two** other safety precautions you should take when operating a milling machine.

1

.....

..... [2]

2

.....

..... [2]

(c) Quality control checks are carried out when making engineered products.

(i) Describe how you would ensure quality of surface finish when operating a milling machine.

.....

.....

..... [2]

(ii) State what is meant by the term tolerance.

.....

..... [1]

(iii) Describe how you would check that a finished workpiece is within tolerance.

.....

.....

.....

..... [2]

3 (a) A list of engineering materials is shown below.

- HIPS (High Impact Polystyrene)
- Copper
- Cast iron
- Carbon fibre
- Low carbon steel
- PVC (polyvinylchloride)
- Silicon carbide

Complete the sentences below using materials from the list.
You can use a material more than once.

- (i) is a polymer [1]
- (ii) is a ferrous metal [1]
- (iii) is a non-ferrous metal [1]
- (iv) is a ceramic [1]
- (v) is a composite [1]
- (vi) is often supplied in sheet form [1]
- (vii) is often supplied in granular form [1]

(b) Describe what is meant by the term 'alloy'.

.....

.....

..... [2]

4 New technologies are used by engineering industries.

Describe how new technologies are used when:

- Developing design specifications for engineered products
- Producing engineering drawings to current industry standards
- Controlling production.

Developing design specifications for engineered products.

.....

.....

.....

..... [2]

Producing engineering drawings to current industry standards.

.....

.....

.....

..... [2]

Controlling production.

.....

.....

.....

..... [2]

5 (a) Complete the table below by describing **one** example of each engineering process. One has been done for you.

Engineering Process	Description
Chemical treatment	Galvanising is electrically coating with zinc to stop rusting.
Shaping	[2]
Surface finishing	[2]

(b) Choose **one** automated process from the list below.

- Machining
- Surface mounting of electronic components
- Welding

Describe **two** advantages that the introduction of this automated process has brought to the workforce.

Advantage 1.....

 [2]

Advantage 2.....

 [2]

6 Describe the function of any **three** of the engineering components listed below.

- Cam
- Capacitor
- Fuse
- Machine screw
- Non-return valve
- Single acting cylinder

Component 1

Function

.....

..... [2]

Component 2

Function

.....

..... [2]

Component 3

Function

.....

..... [2]

7 The table shows a comparison of six materials that could be used in an engineered product.

MATERIAL	FACTORS TO CONSIDER				
	Ease of storage	Easy to use	Safe to use	Value for money	Readily available
A	8	1	9	9	9
B	5	6	5	5	4
C	8	2	1	2	3
D	2	9	1	2	2
E	3	8	7	3	5
F	9	5	3	9	2

10 = excellent 1 = very poor

(a) State which material is the easiest to store.

..... [1]

(b) Give **two** reasons why material **E** would be a good choice for one-off manual production.

Reason 1

..... [1]

Reason 2

..... [1]

(c) Explain **one** other factor that might be considered when selecting the most suitable material to use in an engineered product.

Factor

Explanation

.....

.....

..... [3]

10
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