OCR
Oxford Cambridge and RSA

Monday 21 May 2018 – 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				

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. If additional space is required, you should use the lined page(s) at the end of this booklet. The question number(s) must be clearly shown.
- Do **not** write in the barcodes.

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.

Answer **all** the questions.

1 A list of engineering sectors is given below.

Aerospace	**Electrical and Electronics**
Automotive	**Medical and Pharmaceutical**
Chemical and Process	**Rail and Marine**
Computers, Communication and IT	**Structural and Civil**

Complete the table below by stating which engineering sector from the list makes the products given.

Product	Sector
Paint	
Portable radio	
Wheelchair	
Sports centre	
Memory card	
Alloy wheels	
Washing machine	

[7]

2 Many different materials are used to make engineered products.

(a) Complete the table below by giving **three** examples of non-ferrous metals and **three** examples of polymers.

Non-ferrous metals	Polymers

[6]

(b) Give **two** justified reasons why a non-ferrous metal might be used instead of a ferrous metal for making an engineered product.

1 .....

.....

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

2 .....

.....

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

3 A list of engineering components is given below.

Bolts	**Resistors**
LEDs	**Switches**
Locknuts	**Three-port valves**
Pulleys	**Transistors**
Reservoirs	**Washers**

(a) Choose components from the list to complete the following statements.

(i) ..... and ..... are mechanical components. **[2]**

(ii) ..... and ..... are electrical/electronic components. **[2]**

(iii) ..... and ..... are pneumatic/hydraulic components. **[2]**

(b) Explain, using **one** example, the function of **one** of the components from the list.

.....

.....

.....

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

4 Fig. 1 shows a hinge bracket that is made in two parts. Both parts are made from mild steel.

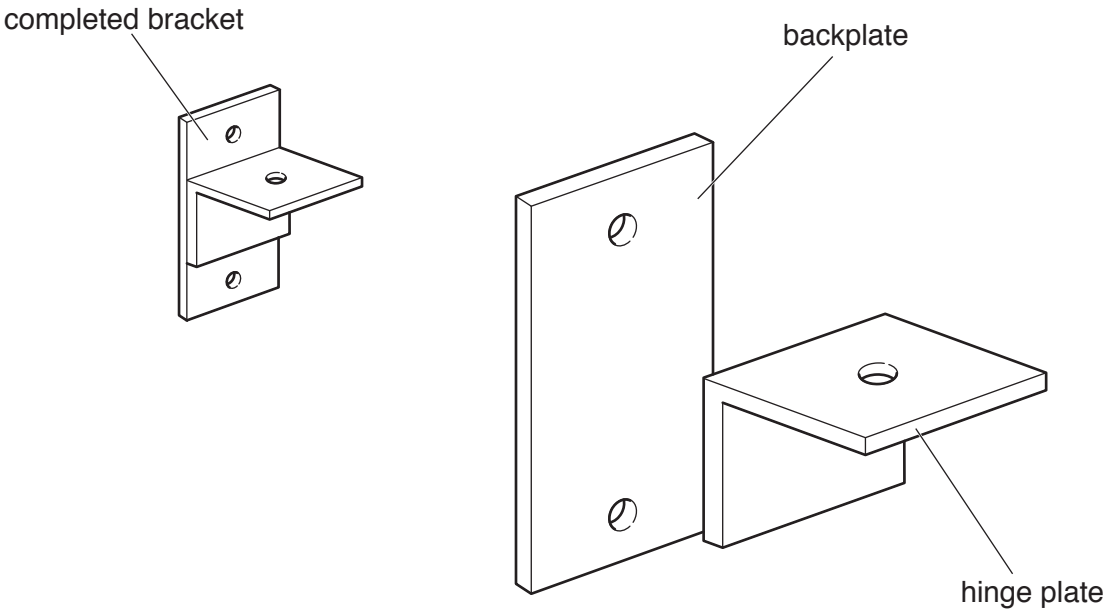

Fig. 1

(a) Name **two** engineering processes that could be used to fix the two parts together.

1 .....

2 .....

[2]

(b) Choose **one** of the processes you have named in part **(a)**.

Process .....

(i) Describe how the parts would be fixed together using this process.

Description .....

.....

.....

.....

.....

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

(ii) Give **two** safety precautions that should be taken when carrying out the process.

1 .....

2 .....

[2]

5 The list below shows stages in the manufacture of an engineered product.

Assembly and finishing
Disposal
Marketing
Material supply and control
Processing and production

(a) Choose **two** of the stages from the list.
Describe how modern technologies can be used in each stage.

1. Stage .....

.....

.....

.....

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

2. Stage .....

.....

.....

.....

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

(b) Describe **one** benefit of using quality control procedures in the manufacture of engineered products.

.....

.....

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

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

	Factors to be considered				
Material	**Easy to store**	**Corrosion resistance**	**Machinability**	**Value for money**	**Easy to handle**
A	**8**	**5**	**6**	**6**	**7**
B	**6**	**3**	**7**	**5**	**6**
C	**4**	**7**	**5**	**3**	**7**
D	**8**	**5**	**6**	**7**	**6**
E	**6**	**8**	**6**	**8**	**9**
F	**7**	**8**	**9**	**7**	**8**

1 = very poor and 10 = excellent

(a) (i) State which material is the easiest to handle. ..... **[1]**

(ii) State which material would be the most suitable for making parts on a milling machine.

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

(b) Give **two** reasons why material **C** might not be suitable for large scale production.

1 .....

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

2 .....

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

(c) (i) Give **one** factor not listed in the table that would need to be considered when choosing a suitable material for an engineered product.

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

(ii) Explain why this factor is important.

.....

.....

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

7 Describe how '*information, communication and digital technologies*' can be used during the following stages in the design of an engineered product.

Use a different example for each stage.

(i) Research

.....

.....

.....

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

(ii) Presenting design solutions to a client

.....

.....

.....

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

8* Discuss the impact of modern technologies on the manufacture of engineered products.

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.....

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

END OF QUESTION PAPER

ADDITIONAL ANSWER SPACE

If additional space is required, you should use the following lined page(s). The question number(s) must be clearly shown in the margin(s).