

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS
GCSE**

A622/02

ENGINEERING

Engineering Processes

MONDAY 21 MAY 2018: Afternoon

**DURATION: 1 hour
plus your additional time allowance**

MODIFIED ENLARGED

Candidate forename		Candidate surname	
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Centre number						Candidate number				
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Candidates answer on the Question Paper.

OCR SUPPLIED MATERIALS:

None

OTHER MATERIALS REQUIRED:

None

READ INSTRUCTIONS OVERLEAF



INSTRUCTIONS TO CANDIDATES

Write your name, centre number and candidate number in the boxes on the front page. 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.

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 (*).

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Answer ALL the questions.

1 A list of engineering sectors is given below.

Aerospace

Automotive

Chemical and Process

Computers, Communication and IT

Electrical and Electronics

Medical and Pharmaceutical

Rail and Marine

Structural and Civil

Complete the table below by stating which engineering sector from the list makes the products given. [7]

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

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. [6]

Non-ferrous metals	Polymers

(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

LEDs

Locknuts

Pulleys

Reservoirs

Resistors

Switches

Three-port valves

Transistors

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]**

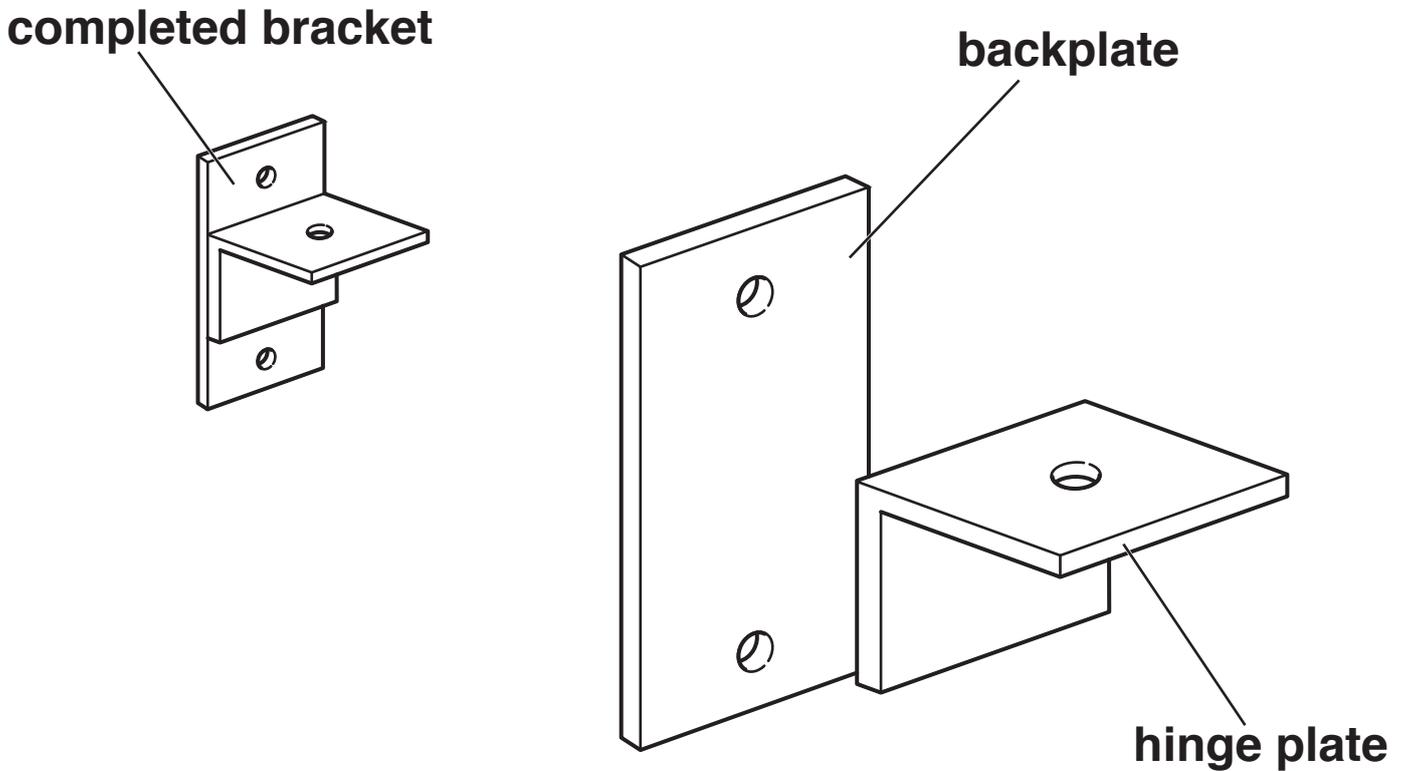
**(iii) _____ and _____
are pneumatic/hydraulic components. [2]**

(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.

1 = very poor and 10 = excellent

Material	Factors to be considered				
	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

(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]

