

Candidate Name	Centre Number	Candidate Number



**OXFORD CAMBRIDGE AND RSA EXAMINATIONS**  
**General Certificate of Secondary Education**

**ENGINEERING (DOUBLE AWARD)**  
**MANUFACTURING (DOUBLE AWARD)**

**4868**  
**4880**

UNIT 3: Application of Technology

Tuesday                      **6 JUNE 2006**                      Afternoon                      1 hour 30 minutes

**TIME**    1 hour 30 minutes

**INSTRUCTIONS TO CANDIDATES**

Write your name, Centre number and candidate number in the spaces at the top of this page.  
 Answer **all** questions.  
 Write your answers in the spaces provided on the question paper.  
 Show all working for calculations.

**INFORMATION FOR CANDIDATES**

The number of marks is given in brackets [ ] at the end of each question or part question.  
 Marks will be awarded for the use of correct conventions.  
 The total number of marks for this paper is **100**.  
 Dimensions are in mm unless stated otherwise.  
 Please note that the instruction 'discuss' denotes that you should:

- identify **three** relevant issues/points raised by the question;
- explain why you consider **two** of these issues to be relevant; and
- use **one** specific example or piece of evidence to support your answer.

<b>FOR EXAMINER'S USE</b>	
<b>Question 1</b>	
<b>Question 2</b>	
<b>Question 3</b>	
<b>Question 4</b>	
<b>Question 5</b>	
<b>Question 6</b>	
<b>Question 7</b>	
<b>Question 8</b>	
<b>TOTAL</b>	

**This question paper consists of 10 printed pages and 2 blank pages.**

1 The table below shows Manufacturing and Engineering Sectors.

Manufacturing Sectors	Engineering Sectors	
Biological and Chemical Engineering Fabrication Food and Drink Paper and Board Printing and Publishing Textiles and Clothing	Aeronautical Automotive Civil Computer Construction Electrical and Electronic	Fluid Marine Mechanical Process Control Telecommunications –

Choose **two** sectors and for each:

- name **one** product produced in the sector;
- state **one** example of technology used in the sector; and
- describe **two** benefits of using the technology in the sector.

**Sector 1** .....

Product .....[1]

Technology .....[1]

Benefit 1 .....

.....[2]

Benefit 2 .....

.....[2]

**Sector 2** .....

Product .....[1]

Technology .....[1]

Benefit 1 .....

.....[2]

Benefit 2 .....

.....[2]

- 2 Complete the table below to show **two** examples of how ICT (Information and Communication Technology) can be used in **each** of the activities.

Activity	ICT	Examples of use
Product design	Database	<i>Research – to find properties of materials</i>
		<i>Research – store information from surveys</i>
Product design	CAD software	[1]
		[1]
Product design	Spreadsheet	[1]
		[1]
Marketing	Internet	[1]
		[1]
Assembly	Stock Control	[1]
		[1]
Assembly	Control Technology	[1]
		[1]
Packaging & Dispatch	Barcoding	[1]
		[1]

3 Product investigation includes simple assessment of properties such as:

- heaviness;
- surface feel;
- scratch resistance; and
- structure.

(a) Describe how the **heaviness** of a product may be assessed.

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

(b) Describe how the **surface feel** of a product may be assessed.

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

(c) Describe how the **scratch resistance** of a product may be assessed.

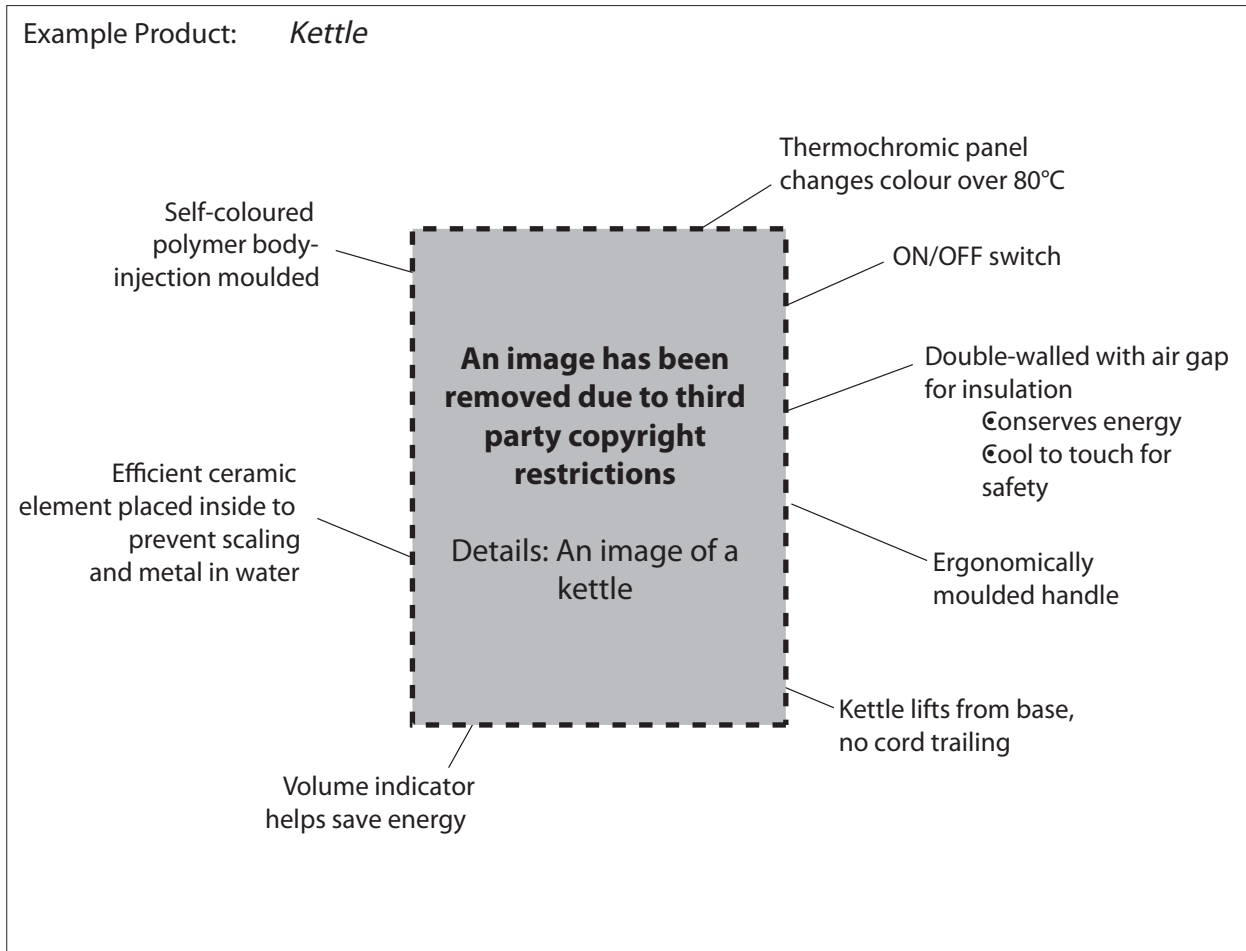
.....  
.....  
.....  
.....[3]

(d) Describe how the **structure** of a product may be assessed.

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

**Turn to page 6 for Question 4.**

- 4 The sketches and notes below explain how technology is used in the design and manufacture of a kettle.



Use sketches and notes to explain how technology is used in the design and manufacture of a different product.

Your answer must include:

- the technologies used;
- how materials/components are used; and
- the structure and form of the product.

[4]

[6]

[4]

Use the example of the kettle to help to plan your answer.

No marks will be awarded for repeated points.

Chosen Product for **Question 4** .....

5 Engineering and Manufacturing sectors use the following computer technologies:

- CAD;
- CAM; and
- CIE or CIM

(a) (i) State what the letters **CAD** stand for.

C..... A..... D..... [1]

(ii) Describe **two** benefits to a company of using CAD.

Benefit 1.....  
.....  
.....[2]

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

(b) (i) State what the letters **CAM** stand for.

C..... A..... M..... [1]

(ii) Describe **two** benefits to a company of using CAM.

Benefit 1.....  
.....  
.....[2]

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

(c) Explain what is meant by

**either** CIE (Computer Integrated Engineering)

**or** CIM (Computer Integrated Manufacturing).

.....  
.....  
.....  
.....  
.....[4]



6 (a) Describe how robotics technology is used in production systems.

.....  
.....  
.....  
.....  
.....  
.....  
.....[4]

(b) Describe **two** benefits to a company of using robotics technology.

Benefit 1 .....  
.....  
.....[2]

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

(c) Describe **two** benefits to a workforce of using robotics technology.

Benefit 1 .....  
.....  
.....[2]

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

- 7 (a) Describe **three** factors a company might take into account when considering whether to use modern technologies during the production of their products.

Factor 1 .....  
.....  
.....  
.....[3]

Factor 2 .....  
.....  
.....  
.....[3]

Factor 3 .....  
.....  
.....  
.....[3]

- (b) Explain why some products might **not** be manufactured using modern technologies.

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

Please note that the instruction ‘discuss’ denotes that you should:

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- explain why you consider **two** of these issues to be relevant; and
- use **one** specific example or piece of evidence to support your answer.

8 (a) Discuss the implications of using production technology in relation to the global environment.

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.....[6]

(b) Discuss the implications of modern technology in relation to society.

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.....[6]

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