

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 **17 JANUARY 2006** Morning 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.

FOR EXAMINER'S USE	
Question 1	
Question 2	
Question 3	
Question 4	
Question 5	
Question 6	
Question 7	
Question 8	
TOTAL	

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 –

Complete the table below to show:

- **one** sector in which each technology is used ;
- **one** product made using the technology; and
- **two** benefits of using the technology.

The first one has been done for you.

Technology	Sector where it is used	Product using the technology	Benefits of using the technology
Computer Spreadsheet	<i>Food and drink</i>	<i>Ready meal</i>	<i>Can calculate and check nutritional value</i>
			<i>Can adjust quantities and it automatically recalculates</i>
Metal alloys	[1]	[1]	[1]
			[1]
Plastics	[1]	[1]	[1]
			[1]
CAD	[1]	[1]	[1]
			[1]

2 The tables below show technologies and their areas.

- (a) Draw a line to link each of the technologies to its appropriate area. One link has been drawn for you.

Technologies	Areas
Carbon fibre composites	Information and Communications Technology (ICT)
Computer Aided Design	Modern materials
Communications technology	Systems and Control Technology
Robotics	
Modified starch	
Polystyrene polymer	
Databases of materials	

[6]

- (b) Using **different** technologies from the ones shown in **Question 2(a)**, complete the table to show **two** more technologies for each area.

Area	Technologies
Information and Communication Technology (ICT)	[1]
	[1]
Modern materials	[1]
	[1]
Systems and Control Technology	[1]
	[1]

- 3 When a product is made it needs to pass through the following stages of production:
- assembly;
 - finishing; and
 - packaging.

Write the name of a product that you have investigated.

Name of product

Describe **two** activities that are carried out on your chosen product at **each** of the stages.

(a) Assembly stage

Activity 1

.....

.....[2]

Activity 2.....

.....

.....[2]

(b) Finishing stage

Activity 1

.....

.....[2]

Activity 2.....

.....

.....[2]

(c) Packaging stage

Activity 1

.....

.....[2]

Activity 2.....

.....

.....[2]

4 An engineering or manufacturing company wants to introduce Systems and Control Technology.

(a) State **four** costs to a company when introducing Systems and Control Technology.

Cost 1[1]

Cost 2.....[1]

Cost 3.....[1]

Cost 4.....[1]

A company is introducing Systems and Control Technology to save money.

(b) Describe **three** ways a company can save money by using Systems and Control Technology.

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

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

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

(c) Describe **two** benefits, other than saving money, that a company might gain by using Systems and Control Technology.

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

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

- 5 The sketches and notes below explain how technology is used in the design and manufacture of a golf club.



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; [4]
- how materials/components are used; and [6]
- the structure and form of the product. [4]

Use the example of the golf club to help to plan your answer.

No marks will be awarded for repeated points.

Chosen product for **Question 5**

- 6 The characteristics of many products have changed because of technological developments.

An example product is shown in the table below.

Complete the table below to show **three** other products, the technological development involved and how the product has changed.

Product	Technological development	How the product has changed
<i>Golf Club shaft</i>	<i>Composite materials</i>	<i>The shaft of the golf club used to be made from steel. This has been replaced by lightweight carbon fibre composite. Clubs can be produced with different amounts of flexibility.</i>
	[1]	[3]
	[1]	[3]
	[1]	[3]

7 CIM (Computer Integrated Manufacturing) and CIE (Computer Integrated Engineering) are used extensively in industry.

Explain **four** benefits to a company of using CIM **or** CIE.

Benefit 1
.....
.....
.....
.....[3]

Benefit 2
.....
.....
.....
.....[3]

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

Benefit 4
.....
.....
.....
.....[3]

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