Candidate Name	Centre Number	Candidate Number

OCR
RECOGNISING ACHIEVEMENT

OXFORD CAMBRIDGE AND RSA EXAMINATIONS
General Certificate of Secondary Education

ENGINEERING (DOUBLE AWARD) 4868
MANUFACTURING (DOUBLE AWARD) 4880

UNIT 3: Application of Technology

Wednesday **8 JUNE 2005** 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 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	

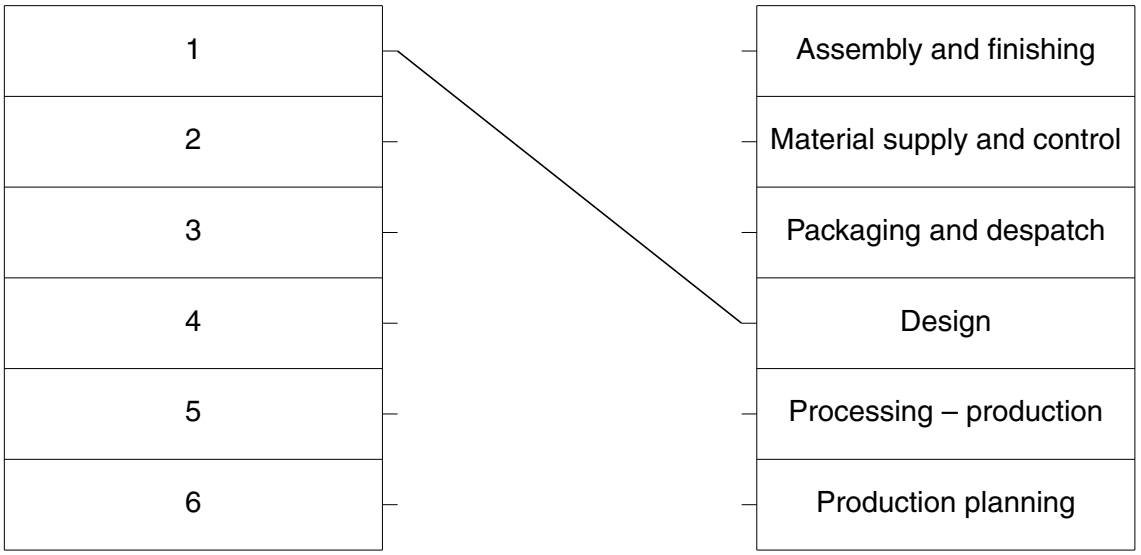
This question paper consists of 11 printed pages and 1 blank page.

Registered Charity Number: 1066969
[Turn over

1 **(a)** The stages in making a product are:

- assembly and finishing;
- material supply and control;
- packaging and despatch;
- design;
- processing – production; and
- production planning.

Complete the links below to show the correct order in which the stages are carried out. The first stage has been done for you.



[5]

(b) **(i)** State **two** things that happen during the design stage of making a product.

1.....[1]

2.....[1]

(ii) State **two** things that happen to a product during the assembly and finishing stage.

1.....[1]

2.....[1]

(iii) State **three** things that happen to a product during the packaging and dispatch stage.

1.....[1]

2.....[1]

3.....[1]

2 **(a)** One technology that could be used in production and processing is robotics.

(i) State **one** product that is made using robotics.

.....[1]

(ii) Describe **one** way robotics is used when making a product.

.....

.....

.....[2]

(iii) State **three** benefits of using robotics when making a product.

Benefit 1.....[1]

Benefit 2.....[1]

Benefit 3.....[1]

(iv) State **two** disadvantages of using robotics when making a product.

Disadvantage 1.....[1]

Disadvantage 2.....[1]

(b) Computers are used to monitor production.

(i) Name a product where a computer is used to monitor production.

.....[1]

For the product you have named in **2 (b) (i)**:

(ii) State **one** part of the production process that is monitored using a computer.

.....[1]

(iii) Describe how the computer is used to monitor production.

.....

.....

.....[2]

3 Four examples of ICT used in the design stage are:

- spreadsheets;
- database of components;
- internet; and
- computer aided design (CAD) software.

Complete the table below for each example of ICT.
The first one has been done for you.

Example of ICT	Describe how it is used in designing	Describe one advantage of its use
Spreadsheets	A spreadsheet does calculations automatically so that you can enter different costs for materials, labour etc and it will work out the cost of the product.	You don't have to do a new calculation for everything you change in the design, just enter the new costs.
Database of components	.....	.....
Internet	.....	.....
Computer aided design (CAD) software	.....	.....

[12]

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PLEASE TURN OVER FOR QUESTION 4

4 The table below shows Engineering and Manufacturing sectors.

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

Choose **four** sectors and write the name of each chosen sector in the table below.

(a) Complete the table by:

- naming a typical product from each sector; and
- describing how modern technology has improved the key features of the product.

	How modern technology has improved its key features
Sector 1 ..... Product ..... [1]	.... [2]
Sector 2 ..... Product ..... [1]	.... [2]
Sector 3 ..... Product ..... [1]	.... [2]
Sector 4 ..... Product ..... [1]	.... [2]

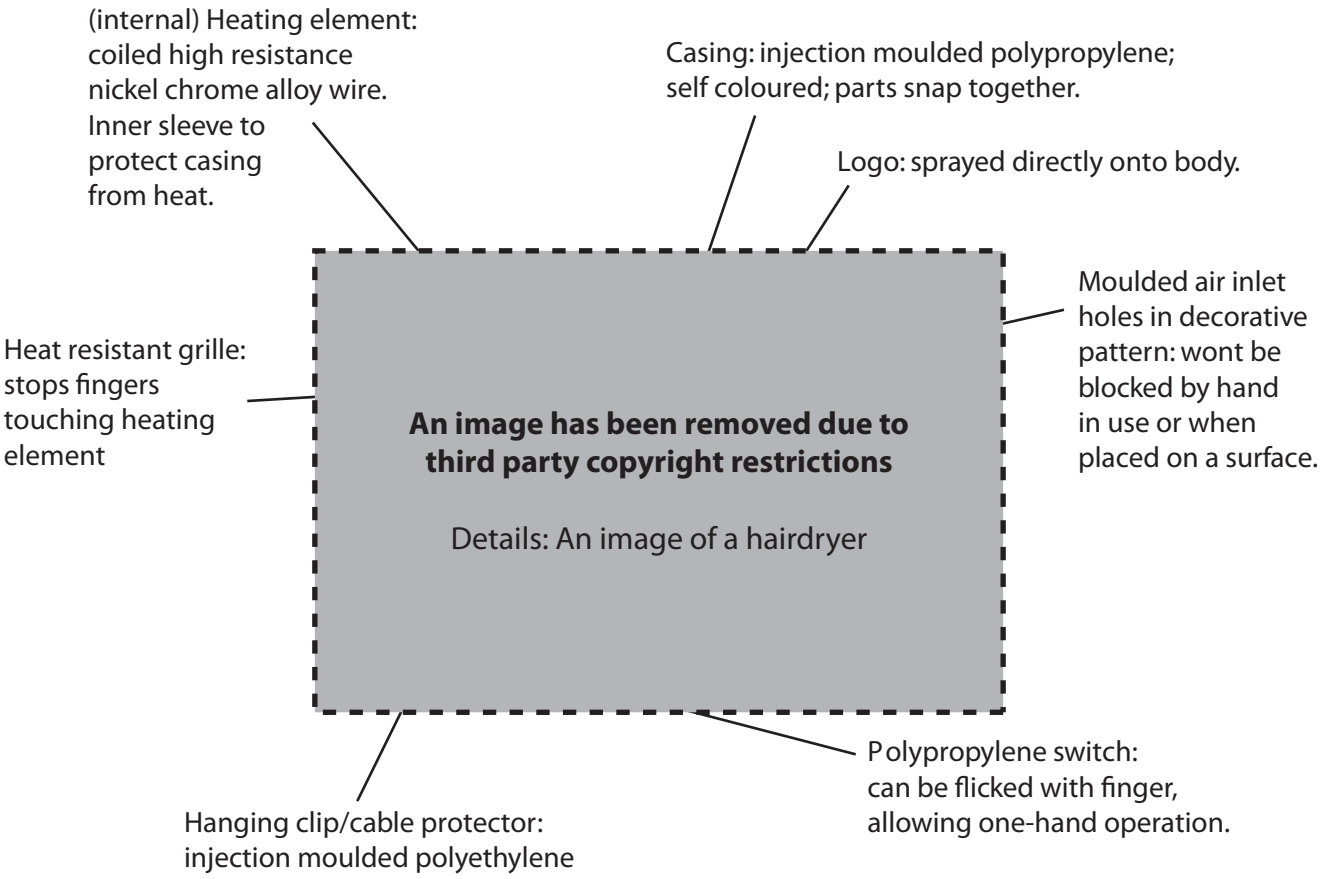
Some products can be placed in more than one sector.

(b) Complete the table below to show a product and **two** sectors into which it can be placed.

Product	Sector 1	Sector 2
	[1]	[1]

[Turn over

5 The sketch and notes below explain how technology is used in the design and manufacture of a hairdryer.



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

Your answer must include:

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

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

No marks will be awarded for repeated points.

Chosen product for Question 5 .....

6 Companies use control systems when making products.
Stages of a control system are shown below.

(a) Describe the stages of a control system you have studied.

Input:

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.....

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Process:

.....

.....

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Output:

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.....

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[6]

(b) Describe **two** ways in which embedded systems have influenced the development of products.

1 .....

.....

.....[2]

2 .....

.....

.....[2]

(c) Describe **one** way in which programmable logic controllers (PLCs) have had an impact on engineered or manufactured products.

.....

.....

.....[2]

7 The application of technology in engineering and manufacturing has brought advantages to society.

(a) Describe **one** way in which technology has improved product safety.

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.....[2]

(b) Describe **three** different advantages to the workforce of using technology.

1 .....

.....

.....[2]

2 .....

.....

.....[2]

3 .....

.....

.....[2]

(c) Describe **two** different advantages to consumers of the application of technology.

1 .....

.....

.....[2]

2 .....

.....

.....[2]

For Examiner's Use

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 evidence to support your answer.

8 (a) Discuss the implications of sustainability when designing and making products.

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.....[6]

(b) Discuss the impact of modern technologies on existing and new markets for products.

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.....[6]