

**GENERAL CERTIFICATE OF SECONDARY EDUCATION
 MANUFACTURING (DOUBLE AWARD)**

4880

Unit 3: Application of Technology

MONDAY 2 JUNE 2008

Morning
 Time: 1 hour 30 minutes

Candidates answer on the question paper

Additional materials: No additional materials are required



Candidate Forename

Candidate Surname

Centre Number

Candidate Number

INSTRUCTIONS TO CANDIDATES

- Write your name in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Show all working for calculations.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided.

INFORMATION FOR CANDIDATES

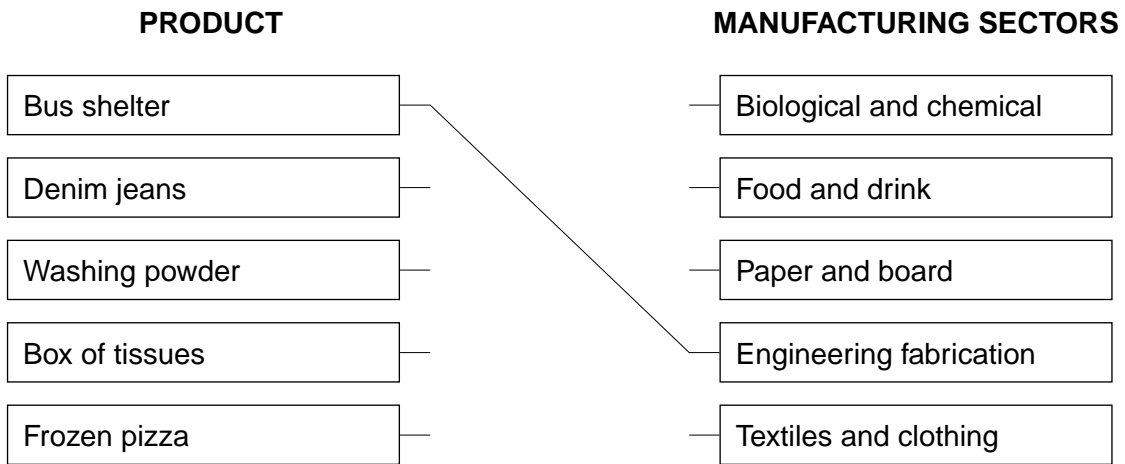
- The number of marks for each question is given in brackets [] at the end of each question or part question.
- Marks will be awarded for the use of correct conventions.
- The total number of marks for this paper is **100**.
- Dimensions are in mm unless stated otherwise.
- Please note that the instruction '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;
 - use **one** specific example or piece of evidence to support your answer.

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

This document consists of **12** printed pages and **4** blank pages.

1 Manufacturing sectors produce different products.

(a) Complete the links below to identify the sector which makes the products listed. One has been done for you.



[4]

(b) For **three** of the products above, complete the table to show:

- **one** example of technology used in each product;
- **one** benefit of using that technology in the product.

An example has been done for you.

Product	Technology used	Benefit
Bus shelter	Electronic Displays	easily updated
	[1]	[1]
	[1]	[1]
	[1]	[1]

(c) Name **two** products from the printing and publishing sector.

Product 1[1]

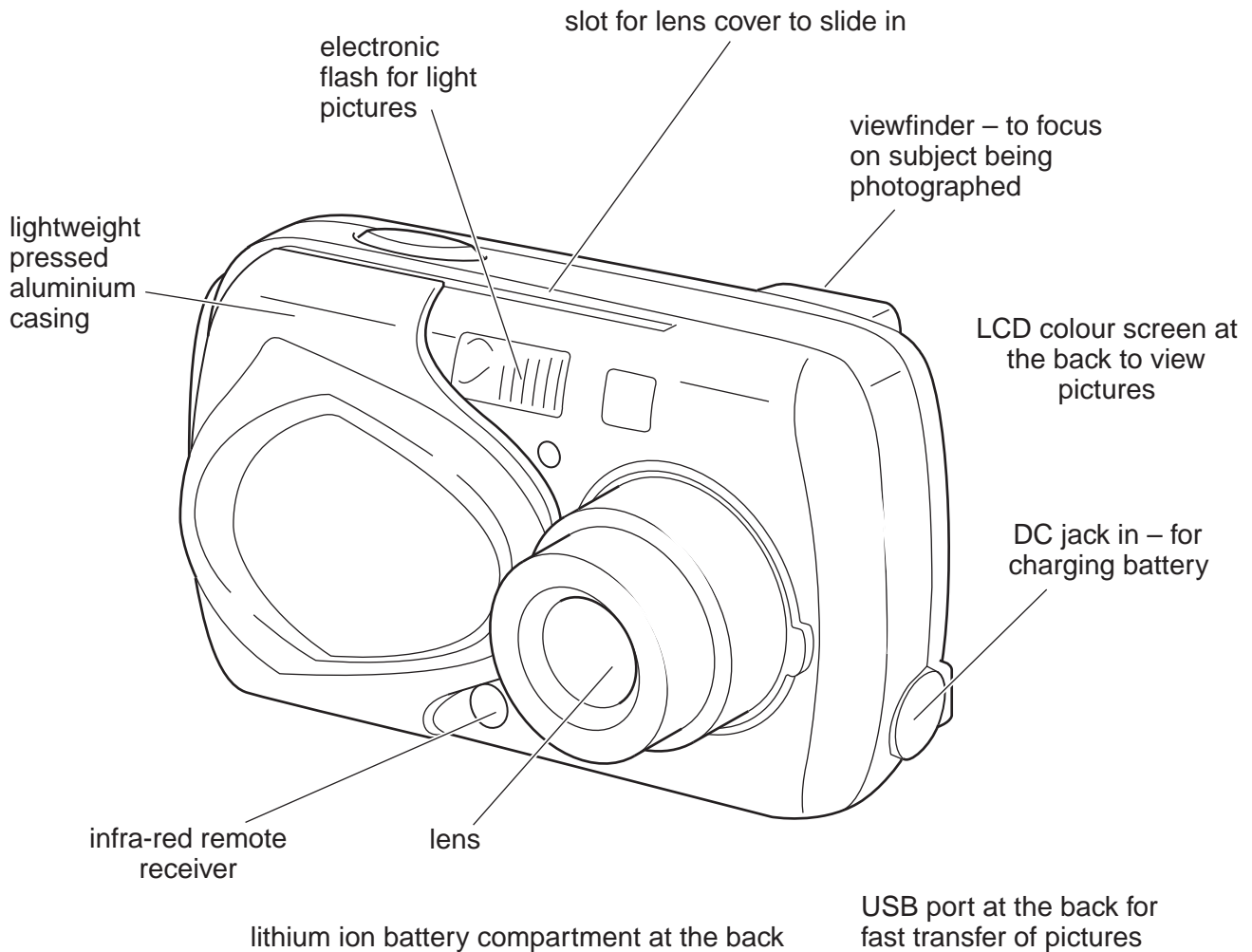
Product 2[1]

3
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- 2 The sketch and notes below explain how technology and materials are used in the design and manufacture of a digital camera.

Example product: *Digital Camera*



Choose a **different** product and use sketches and notes to explain how technology and materials are used in its design and manufacture.

Your answer must include:

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

Use the example of the digital camera to help plan your answer.

Marks will NOT be given for information copied from the example.

Your chosen product for **Question 2**.

3 A CAD package can be used to produce manufacturing drawings which are saved on computer.

(a) (i) Describe **one** benefit of saving CAD drawings on a computer.

.....

[2]

(ii) Describe **two** different benefits of using CAD to produce manufacturing drawings.

Benefit 1
[2]

Benefit 2
[2]

(b) Other ICT applications are used when designing products for manufacture.

Complete the table below to identify:

- a different ICT application for each design task;
- a different activity carried out when using the ICT application.

An example has been done for you.

Design task	ICT application	Activity carried out
Research materials available	Web browser	Use on-line encyclopaedia
Contact material supplier	[1]	[1]
Evaluating design ideas	[1]	[1]
Show designs to a client	[1]	[1]

7
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- 4 The use of modern technology can:
- reduce the weight of a product;
 - make a product easier to use;
 - make a product safer;
 - reduce a product's impact on the environment.

(a) State **one** example of a product that uses modern technology to reduce its weight and state the technology used.

Product[1]

Technology[1]

(b) State **one** example of a product that uses modern technology to make it easier to use and state the technology used.

Product[1]

Technology[1]

(c) State **one** example of a product using modern technology to make it safer and state the technology used.

Product[1]

Technology[1]

(d) State **one** example of a product using modern technology which helps to reduce its impact on the environment and state the technology used.

Product[1]

Technology[1]

(e) Give **two** disadvantages to a company when it starts to use modern technology for the first time.

Disadvantage 1[1]

Disadvantage 2[1]

(f) Describe **two** benefits to society when modern technology is used in a product.

Name of product

Benefit 1

.....[2]

Benefit 2

.....[2]

5 Examples of some types of materials are:

- alloys;
- biological materials;
- composites;
- food ingredients;
- polymers;
- textiles.

(a) Choose **two** of the types of materials listed above and, for each type, complete a table to show:

- **two** different specific materials of that type;
- **one** product in which each material is used;
- **one** property of each material which makes it suitable for use in the products.

Chosen material type 1

Specific material	Product	Material property
[1]	[1]	[1]
[1]	[1]	[1]

Chosen material type 2

Specific material	Product	Material property
[1]	[1]	[1]
[1]	[1]	[1]

(b) For **one** of the specific materials you stated in part (a), describe **one** benefit to the consumer when using the material in a manufactured product.

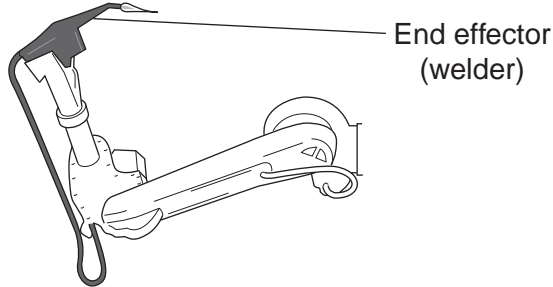
Material

Benefit

.....
 [2]

- 6 Three examples of systems and control technology are:
- Robotics;
 - Programmable Logic Controllers (PLCs);
 - Control using general purpose computers and components.

(a) Part of a robot is shown below.



The end effector can be changed to suit the task.

Complete the table below to show **two different** uses of robotics in production.

Product	Robotic process	Type of end effector
[1]	[1]	[1]
[1]	[1]	[1]

(b) (i) State **two** different uses of PLCs in production processes.

1
[1]

2
[1]

(ii) Describe **two** advantages of using PLCs rather than general purpose computers in production processes.

1
[2]

2
[2]

7 (a) Explain what is meant by Computer Integrated Manufacturing (CIM).

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

(b) Potential benefits to a manufacturing company when using CIM include:

- improved product quality;
- efficient production planning;
- shorter time taken to get a new product onto the market (shorter lead time).

(i) Describe how CIM improves product quality.

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

(ii) Describe **two** ways in which CIM improves production planning efficiency.

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

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

(iii) Give **two** reasons why reducing lead time is a benefit to a manufacturing company.

1
.....[1]

2
.....[1]

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