

Surname		Other Names	
Centre Number		Candidate Number	
Candidate Signature			

For Examiner's Use

General Certificate of Secondary Education
June 2008

ENGINEERING (DOUBLE AWARD)
Unit 3 Application of Technology

3870/3



Monday 2 June 2008 9.00 am to 10.30 am

You will need no other materials.
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Time allowed: 1 hour 30 minutes

Instructions

- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Answers written in margins or on blank pages will not be marked.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The maximum mark for this paper is 100.
- The marks for questions are shown in brackets.

For Examiner's Use			
Question	Mark	Question	Mark
1		9	
2			
3			
4			
5			
6			
7			
8			
Total (Column 1) →			
Total (Column 2) →			
TOTAL			
Examiner's Initials			



Answer **all** questions in the spaces provided.

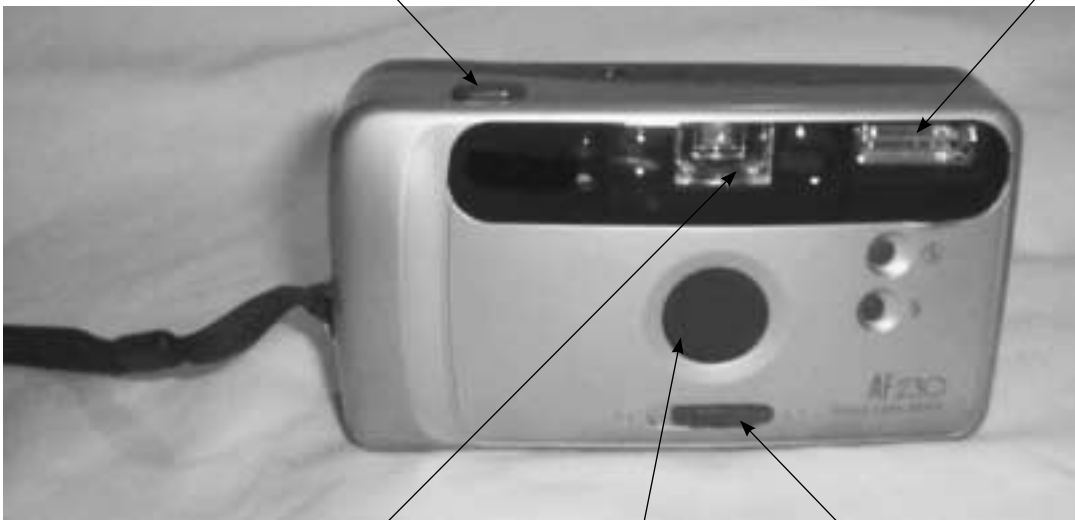
1 This question is about investigating products.

1 (a) A compact camera is shown below.

Complete the labels below by identifying the parts of the camera.

Part a

Part b



Part c

Part e

Part d

(5 marks)

1 (b) State the function of part c.

.....
.....

(2 marks)



1 (c) (i) Describe the purpose of part d.

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.....
.....

(2 marks)

1 (c) (ii) Explain how parts d and e work together.

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.....
.....
.....

(2 marks)

11

Turn over for the next question

Turn over ▶



2 This question is about the technology used to make photographs.

Describe how film and digital cameras carry out the same processes using different technologies.

Process	Film	Digital
capturing an image		
method of storing the image		
finding the image for later use		
producing an image on paper		

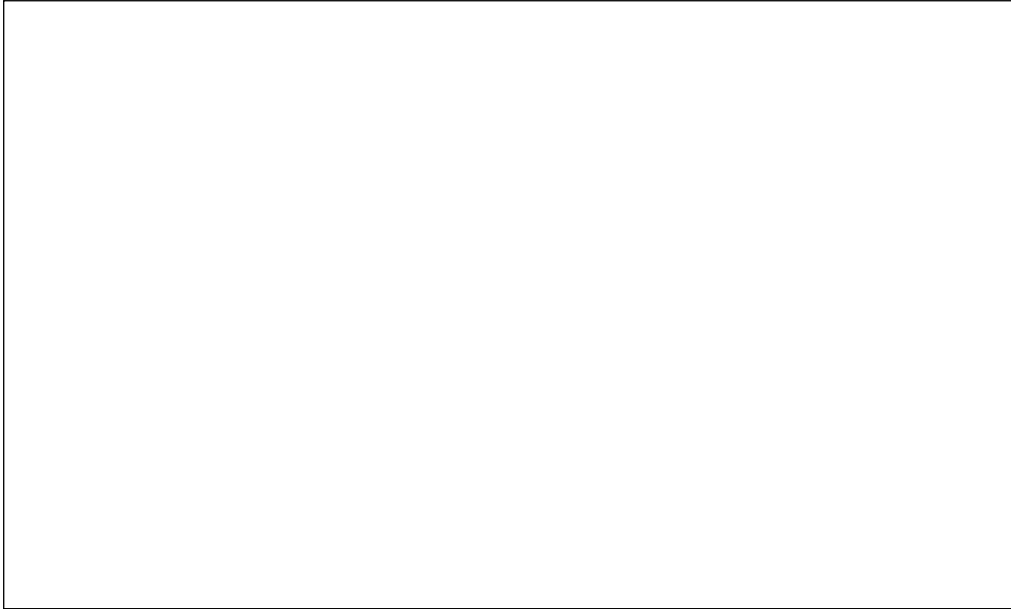
(8 marks)

8



3 This question is about the use of new technology in engineered products.

3 (a) Explain, with an annotated sketch, how a digital camera is connected to a computer or printer.



(2 marks)

3 (b) Describe **two** examples of how a computer is used to adjust a digital image.

Example 1

.....

Example 2

.....

(2 marks)

3 (c) Explain **one** factor that will affect the quality of a digital print.

.....

.....

.....

.....

(2 marks)

6

Turn over ▶



4 This question is about transferring images.

Images often need to be sent between two different places, for example from London to New York.

4 (a) Describe **two** methods that are used to send digital images and give a benefit for using each method.

Method 1

.....

Benefit

.....

Method 2

.....

Benefit

.....

(4 marks)

4 (b) Give a benefit of transferring a digital image compared to a traditional photograph.

.....

.....

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(2 marks)

6



5 This question is about the impact of technology.

5 (a) Name the engineering sector where digital cameras are made.

.....
(1 mark)

5 (b) Describe **two** advantages to the consumer of using a digital camera over a film camera.

Advantage 1

.....

Advantage 2

.....

(2 marks)

5 (c) State **three** changes which have resulted from the increased use of digital cameras.

1

.....

2

.....

3

.....

(3 marks)

5 (d) Identify **one** chemical substance that is used in photographic film processing and explain its function.

Substance

Function

.....

.....

(3 marks)

Question 5 continues on the next page

Turn over ▶



5 (e) (i) Describe how using film and photographic paper has an impact on the environment.

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(2 marks)

5 (e) (ii) Explain how this situation has been improved by using digital photography.

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(3 marks)

5 (f) Describe how the increasing use of digital technology has affected the type and size of the workforce in the film processing industry.

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.....

(3 marks)



6 This question is about investigating products.

A single use camera is manufactured from the components and assemblies shown in the photograph below.



6 (a) Explain how industrial manufacturing techniques could be used to assemble the single use camera for the first time.

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Question 6 continues on the next page

(4 marks)

Turn over ►



6 (b) (i) State **two** material properties needed for a plastic lens.

Property 1

Property 2

(2 marks)

6 (b) (ii) Describe the process for manufacturing the lens from a plastics material.

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(4 marks)



- 6 (c) The single use camera can be 'reloaded' after use. This is done when the camera is returned, and the used film is removed for processing. The photograph below shows the components ready for re-assembly.



Explain how Computer Aided Manufacturing (CAM) techniques could be used to load the film and re-assemble the camera.

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(6 marks)

Turn over for the next question

Turn over ▶



7 This question is about new components.

A digital camera contains the components listed below. Describe the function of each of the following.

7 (a) image sensor
.....
.....
(2 marks)

7 (b) motor drive
.....
.....
(2 marks)

7 (c) microprocessor
.....
.....
(2 marks)

7 (d) actuator
.....
.....
(2 marks)

7 (e) programme stored in Read Only Memory (ROM)
.....
.....
(2 marks)

7 (f) display screen
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.....
(2 marks)



7 (g) memory card
.....
.....
(2 marks)

7 (h) Random Access Memory (RAM)
.....
.....
(2 marks)

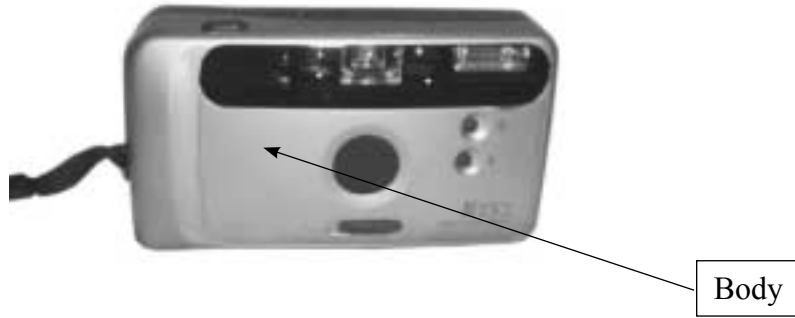
16

Turn over for the next question

Turn over ▶



8 This question is about using materials including smart materials.



8 (a) (i) Identify a suitable specific material from which the camera body could be made.

.....

(1 mark)

8 (a) (ii) Complete the table below to state **two** properties of the material, and a reason for the importance of each property. An example has been completed for you.

Property	Reason for the importance
<i>Opaque</i>	<i>Won't let light through</i>

(4 marks)

8 (b) Describe how the material would be tested to ensure that it does not let light through.

.....

(3 marks)



- 8** (c) Some smart materials react to temperature.
Describe **one** example where a material that reacts to temperature is used in a product.

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(2 marks)

Turn over for the next question

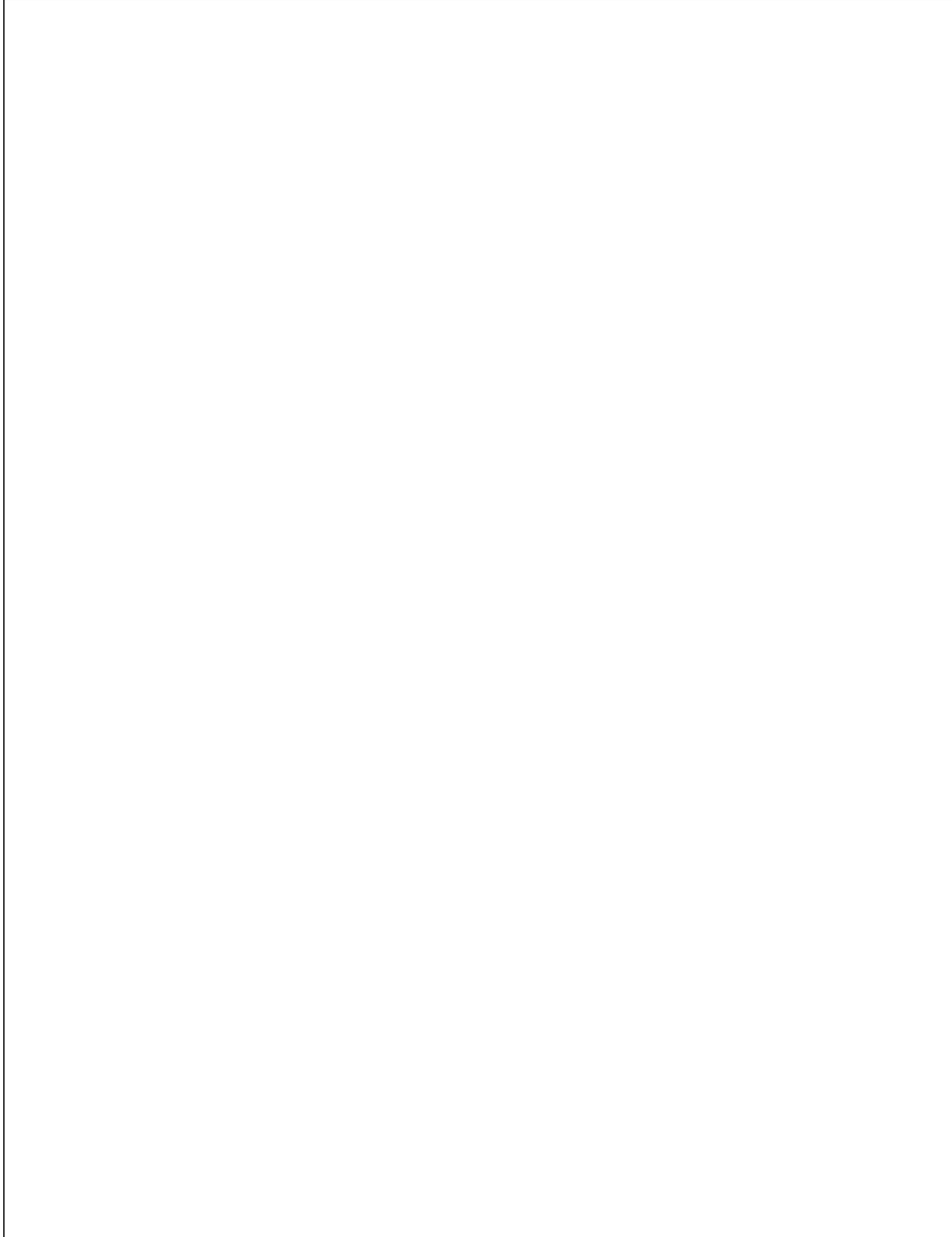
10

Turn over ▶



9 This question is about the use of technology in products.

Explain, using notes and sketches, how a shutter and motor drive work together in a motorised film camera. Include any sensors and actuators which would be used.



Information conveyed (8 marks)

Quality of drawing (2 marks)

END OF QUESTIONS

10

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