

Candidate Name	Centre Number	Candidate Number

WELSH JOINT EDUCATION COMMITTEE
General Certificate of Secondary Education



CYD-BWYLLGOR ADDYSG CYMRU
Tystysgrif Gyffredinol Addysg Uwchradd

273/01

**GCSE
DESIGN AND TECHNOLOGY**

SHORT COURSE

FOCUS AREA: SYSTEMS AND CONTROL TECHNOLOGY

(Foundation Tier - Grades G to C)

P.M. TUESDAY, 5 June 2007

(1 Hour)

	Leave Blank
Question 1	
Question 2	
Question 3	
Question 4	
TOTAL MARK	

ADDITIONAL MATERIALS

You will need basic drawing equipment and coloured pencils for this examination.

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 in this booklet. Where the space is not sufficient for your answer, continue the answer at the back of the book, taking care to number the continuation correctly.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets at the end of each question or part-question.

No certificate will be awarded to a candidate detected in any unfair practice during the examination.

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

1. (a) A designer needs to carry out research before designing a new toy for a three-year-old child.



Draw a line to match the **research activity** with the **information found**.
One has been done for you.

3 × [1]

Research Activity	Information found
Look at tables of children's sizes	What children can do
Read a book on child development	Size of children's hands
Look at a materials properties website	Find the most popular colour
Talk to a three-year-old child	Safety of materials

- (b) Give **three** safety concerns that a parent may have when buying a toy.

3 × [2]

Concern 1:

.....

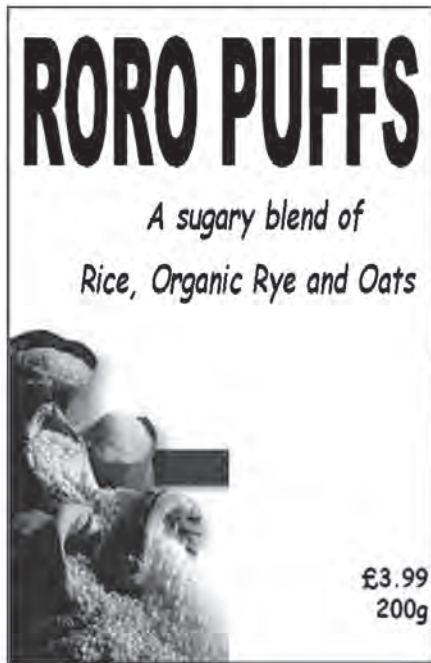
Concern 2:

.....

Concern 3:

.....

2. Sales of the breakfast cereal shown below are falling.



Ingredients: Rice, rye, oats, honey, sugar, salt.			
	Guideline daily amount	Each serving with milk	% guideline daily amount
Calories	2000kcal	170kcal	8%
Sugar	90g	27.8g	30%
Salt	6g	0.8g	14%
Saturated fat	20g	2.4g	12%
Fat	70g	4.0g	6%

(a) **Study** the pictures shown and **give two** reasons why you think sales of this cereal have fallen. 2 × [2]




Reason 1:

.....

Reason 2:

.....

(b) The pictures below show three kettles.

			
Kettle	A	B	C
Cost	£4.99	£19.99	£37.99
Materials	White Plastic	Stainless Steel	Colour Changing Plastic
Where made	China	Europe	UK
Water capacity	1.5 Litres	1 Litre	2.3 Litres

(i) **State** which kettle holds the most water. [1]

.....

(ii) **State** which kettle you think is the easiest to use and **give two** reasons for your choice. 2 × [1]

Kettle is easiest to use.

Reason 1:

.....

Reason 2:

.....

(iii) Even though it is expensive, some people would decide to buy kettle C. **Give one** reason for this. [2]

.....

.....

(iv) **State** the price of kettle A. [1]

.....

(v) **Give two** reasons why kettle A can be sold at this price. 2 × [2]

Reason 1:

.....

Reason 2:

.....

3. (a) One part of the design process is called *development*. Place a **tick** (✓) next to the **three** activities that are part of *development*. 3 × [1]

Test the finished product.	
Decide on final sizes.	
Try out different materials and finishes.	
Think about possible ways to join parts together.	
Draw initial ideas for the product.	

- (b) **Describe two** ways in which ICT/CAD could be used to help with the development of a new product. 2 × [2]

(I)

.....

(II)

.....

- (c) For a product of your choice, **describe two** benefits of using CAM (computer aided manufacturing) to make the product. 3 × [1]

Product:

Benefit 1:

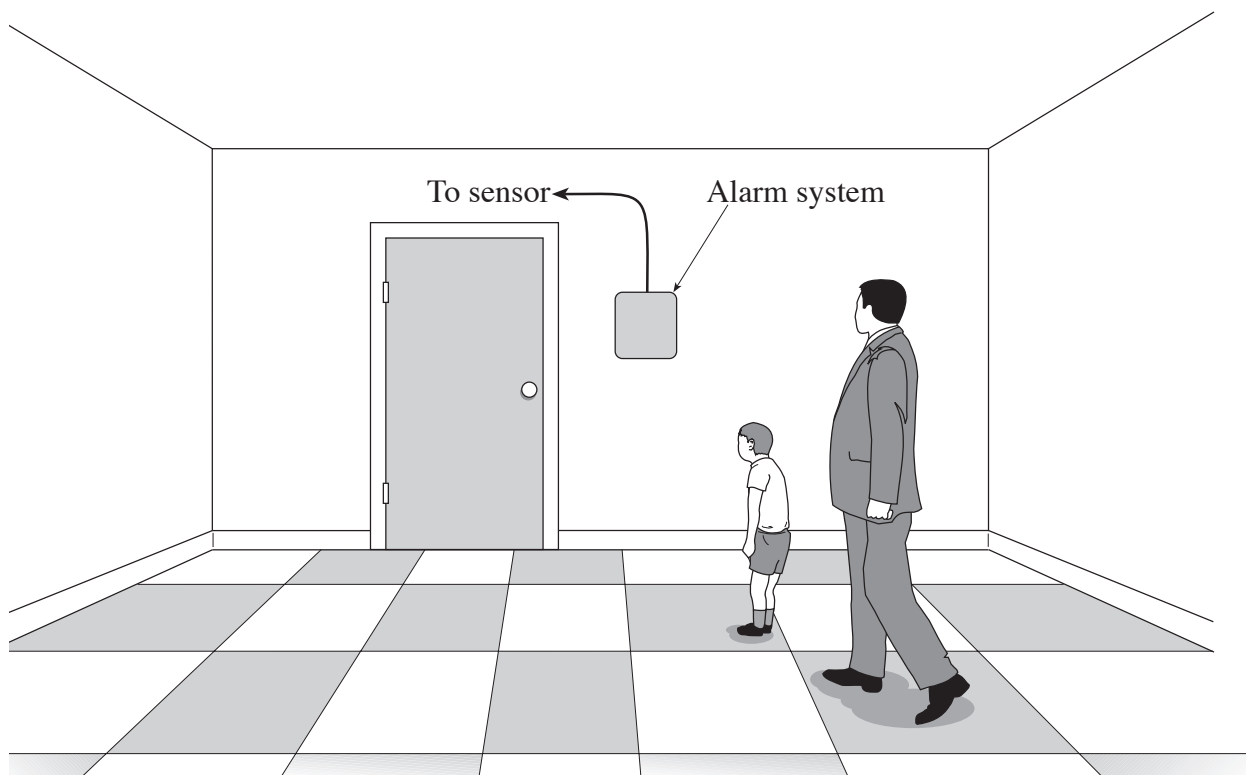
Benefit 2:

- (d) **Describe one** environmental issue that should be taken into account when *designing* products. [2]

.....

.....

4. The owner of a nursery group has asked you to **design** an alarm system that will warn the nursery teacher that the nursery room door has been opened by a child or other person.



SPECIFICATION

The alarm must:

- warn the teacher that the door has been opened;
- be battery powered;
- be able to be armed and disarmed by the teacher but not by a child in the group;
- be securely cased and fixed in an appropriate position.

Sketch your design in the boxes on the following pages.

Marks will be awarded for:

- | | | |
|-------|--|-----|
| (i) | a clear block diagram based on INPUT, PROCESS and OUTPUT of the control system for the device; | [4] |
| (ii) | fully labelled details of the electronic circuit used in the alarm; | [6] |
| (iii) | clear details of how the alarm is triggered by the door opening; | [4] |
| (iv) | clear details of a case and how the circuit fits into it; | [3] |
| (v) | details of how the alarm cannot be armed or disarmed by a child; | [2] |
| (vi) | quality of communication. | [6] |

(i) Draw a block diagram of your system.

(ii) Draw a labelled circuit diagram of your system.

(iii) Draw details of how the alarm will be triggered when the door is opened.

(iv) Draw one design for a suitable case for the alarm showing how the circuit fits into it and showing how the alarm cannot be altered by a child.

