

Surname						Other Names					
Centre Number						Candidate Number					
Candidate Signature											

For Examiner's Use

General Certificate of Secondary Education
June 2007

**DESIGN AND TECHNOLOGY
(RESISTANT MATERIALS TECHNOLOGY)
Written Paper
Higher Tier**

**3545/H
H**



Friday 25 May 2007 9.00 am to 11.00 am

For this paper you must have:

- a pen, a pencil, a ruler, an eraser, a pencil sharpener and coloured pencils
- an insert of colour photographs (enclosed).

Time allowed: 2 hours

Instructions

- Use blue or black ink or ball-point pen. Use pencil and coloured pencils only for drawing.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- Answer the questions in the spaces provided.
- Do all rough work in this book. Cross through any work you do not want to be marked.
- Show the working of your calculations.

Information

- The maximum mark for this paper is 125.
- The marks for questions are shown in brackets.
- You are reminded of the need for good English and clear presentation in your answers.

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			

Questions 1 to 3 on this paper relate to the **Design Brief** given below.

Design Brief

A manufacturer of CD and DVD storage systems wishes to extend its range of products to include computer games storage systems.

You are to produce **three** different design ideas for a computer games storage system.

Your design ideas should focus on the following situations:

Situation 1 a design for a young child

Situation 2 a design for a teenager

Situation 3 a design which can be given away inside a computer games magazine.

Examples of typical computer games are shown below.

Due to copyright issues, the examples of two typical computer games have been removed for electronic production.

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

Question 1 is about the Design Specification.

You are advised to spend about 5 minutes on this question.

- 1** Give **five** design requirements for a computer games storage system.

Explain each of your answers.

Requirement 1:

Explanation:

.....
(2 marks)

Requirement 2:

Explanation:

.....
(2 marks)

Requirement 3:

Explanation:

.....
(2 marks)

Requirement 4:

Explanation:

.....
(2 marks)

Requirement 5:

Explanation:

.....
(2 marks)

Question 2 is about design ideas.

You are advised to spend about 40 minutes on this question.

- 2** Study the information given in the **Design Brief** (page 2) and your **Design Specification** (page 3).

Use this information to help you sketch **one** design idea for **each** situation given in the **Design Brief**.

Remember to:

- add notes to explain your sketches,
- evaluate each idea.

Marks will be awarded for:

- three different design ideas, *(3 × 6 marks)*
- quality of sketches, *(6 marks)*
- quality of notes, *(3 marks)*
- quality of evaluations. *(3 × 2 marks)*

Situation 1 a design for a young child

Evaluation:

.....

Situation 2 a design for a teenager

Evaluation:

.....

Situation 3 a design which can be given away inside a computer games magazine

In Question 3 you will be asked how this idea will be manufactured in a quantity of 50 000.

Evaluation:

.....

Turn over ►

Question 3 is about making.

You are advised to spend about 15 minutes on this question.

- 3** Use notes and sketches to show details of an industrial process which could be used to manufacture your idea for **Situation 3**.

This product will be given away inside a computer games magazine which has a circulation of 50 000.

Marks will be awarded for:

- a suitable method of manufacture, *(10 marks)*
- quality of sketches, *(2 marks)*
- quality of notes. *(2 marks)*

Question 4 is about marketing and advertising.

You are advised to spend about 10 minutes on this question.

4 (a) Before a product is designed it is useful to carry out market research.

(i) List **three** different methods of carrying out market research.

Method 1:

Method 2:

Method 3: (3 marks)

(ii) Explain why it is important to carry out market research.

.....

.....

..... (2 marks)

(b) Once a product has been manufactured it must then be advertised.

(i) List **three** different methods of advertising a product.

Method 1:

Method 2:

Method 3: (3 marks)

(ii) Explain why it is important to advertise a product.

.....

.....

..... (2 marks)

Question 5 is about using ICT.

You are advised to spend about 10 minutes on this question.

- 5 (a) Identify **three** different ways in which ICT could be used when carrying out research.

Explain each of your answers.

Use 1:

Explanation:

.....
(2 marks)

Use 2:

Explanation:

.....
(2 marks)

Use 3:

Explanation:

.....
(2 marks)

- (b) Explain the meaning of the term CIM (computer integrated manufacture).

.....
.....
.....
(2 marks)

- (c) Explain why CIM is important to manufacturers.

.....
.....
.....
.....
.....
.....
(5 marks)

Question 6 is about health and safety.

You are advised to spend about 10 minutes on this question.

6 Study the personal safety equipment shown in **Figure 1** on the insert of colour photographs.

(a) Complete the table below by:

- naming the personal safety equipment,
- giving an example of a process where it would be used,
- identifying a hazard it prevents.

Personal safety equipment	Name	Process	Hazard
A			
B			
C			

(9 marks)

(b) Give **three** ways in which the use of CAM (computer aided manufacture) has improved safety within the industrial workplace.

1:

.....
(1 mark)

2:

.....
(1 mark)

3:

.....
(1 mark)

Question 7 is about materials and finishes.

You are advised to spend about 10 minutes on this question.

7 Study the remote control holders shown in **Figure 2** on the insert of colour photographs.

- (a) Name **one** suitable, *specific* material which could have been used to make each remote control holder.

Give **two** reasons for **each** choice.

Remote control holder A

Material:
(1 mark)

Reason 1:
.....
(1 mark)

Reason 2:
.....
(1 mark)

Remote control holder B

Material:
(1 mark)

Reason 1:
.....
(1 mark)

Reason 2:
.....
(1 mark)

Remote control holder C

Material:
(1 mark)

Reason 1:
.....
(1 mark)

Reason 2:
.....
(1 mark)

- (b) Name **two** suitable, *specific* finishes for your chosen material for **Remote control holder C**.

Finish 1:
(1 mark)

Finish 2:
(1 mark)

Turn over for the next question

Question 8 is about product analysis.

You are advised to spend about 10 minutes on this question.

8 Study the two power drills shown in **Figure 3** on the insert of colour photographs.

Advances in materials and manufacturing technology have enabled designers to make several improvements to power drills.

Identify **four** improved features that **Drill A** has when compared to **Drill B**.

Explain how each improvement helps the user.

Feature 1:
(1 mark)

How it helps the user
.....
.....
(2 marks)

Feature 2:
(1 mark)

How it helps the user
.....
.....
(2 marks)

Feature 3:
(1 mark)

How it helps the user
.....
.....
(2 marks)

Feature 4:
(1 mark)

How it helps the user
.....
.....
(2 marks)

Question 9 is about quality control.

You are advised to spend about 10 minutes on this question.

9 **Figure 4** on the insert of colour photographs shows a holder for an MP3 player.

The holder has been cut and bent from one piece of acrylic.

- (a) Describe **one** method of ensuring that all the pieces of acrylic are cut to the same size and shape when making a batch of ten holders in a school workshop.

.....

.....

.....

(2 marks)

- (b) Describe **one** method of ensuring that all the pieces of acrylic are bent to the same angle when making a batch of ten holders in a school workshop.

.....

.....

.....

(2 marks)

- (c) Explain the importance of carrying out quality control checks when manufacturing products.

.....

.....

.....

.....

.....

.....

.....

.....

.....

(6 marks)

END OF QUESTIONS

10

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H

Insert

For use with the Written Paper

Figure 1

A



B



C



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Figure 2

Wooden remote control holder

Remote control holder A

Plastic remote control holder

Remote control holder B

Metal remote control holder

Remote control holder C

Due to copyright issues, the examples of two typical computer games
have been removed for electronic production.

Figure 3

Drill A



Drill B



Image of Drill A reproduced by kind permission of Screwfix Direct

Figure 4



