

Surname		Other Names	
Centre Number		Candidate Number	
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General Certificate of Secondary Education
June 2004



DESIGN AND TECHNOLOGY
RESISTANT MATERIALS TECHNOLOGY (Short Course)
Higher Tier

3555/H

H

Wednesday 9 June 2004 1.30 pm to 3.00 pm

In addition to this paper you will require:

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

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

Time allowed: 1 hour 30 minutes

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 in the spaces provided.
- All working must be shown.
- Do all rough work in this book. Cross through any work you do not want marked.

Information

- The maximum mark for this paper is 100.
- Mark allocations are shown in brackets.
- Wherever calculations are needed you should show your working.
- You are reminded of the need for good English and clear presentation.

This paper includes a colour insert sheet.

Questions 1 to 4 on this paper relate to the Design Brief given below.

Design brief

A garden tool manufacturer has asked you to design a *tool transporter*. The *tool transporter* should assist frail or elderly persons to transport small, essential items around the garden.

Examples of items which may need transporting are shown in **Figure 1** on the colour insert sheet.

A black and white copy of **Figure 1** is shown below.

Figure 1 shows a variety of tools, equipment
and products used in gardening.

Figure 1

Answer **all** questions in this paper.

Question 1 is about the design specification.

You should spend about 10 minutes on this question.

1 (a) Give **three** design requirements of the *tool transporter*. Explain each of your answers.

Requirement 1:

Explanation:

.....
(2 marks)

Requirement 2:

Explanation:

.....
(2 marks)

Requirement 3:

Explanation:

.....
(2 marks)

(b) Give **two other** design requirements which are specific to the needs of the frail and elderly.

Requirement 1:

Explanation:

.....
(2 marks)

Requirement 2:

Explanation:

.....
(2 marks)

10

Turn over ►

Question 2 is about design ideas.

You should spend about 25 minutes on this question.

- 2 Study the information given in the **design brief** and your **design specification**. Use this information to help you sketch **two** different design ideas for a *tool transporter* which will satisfy the design brief.

Remember to:

- design for the elderly;
- add notes to explain your sketches;
- evaluate each idea.

This question is worth 24 marks.

Marks will be awarded for:

- **two** different ideas; *(2 × 6 marks)*
- quality of sketches; *(5 marks)*
- quality of notes; *(3 marks)*
- quality of evaluations. *(2 × 2 marks)*

Idea 1

Evaluation:

.....

Idea 2

Evaluation:

.....

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TURN OVER FOR THE NEXT QUESTION

Turn over ►

Question 3 is about the construction of your chosen idea.

You should spend about 10 minutes on this question.

3 Choose **one** of your design ideas from **Question 2**.

Chosen idea: Number

Using notes and sketches, clearly show the **main** method of construction for your *tool transporter*.

This question is worth 11 marks.

Marks will be awarded for:

- suitable method of construction; (6 marks)
- quality of sketches; (3 marks)
- quality of notes. (2 marks)

TURN OVER FOR THE NEXT QUESTION

Turn over ►

Question 4 is about computer-aided design (CAD) and computer-aided manufacture (CAM).

You should spend about 10 minutes on this question.

- 4 Assume that a batch of 500 *tool transporters* are to be made.

Figure 2 shows a self-adhesive vinyl label which is to be applied to the *tool transporter*.

The Tool Transporter

Figure 2

- (a) Explain the factors that may have influenced the choice of material to be used for the label.

Explanation:

.....

.....

.....

.....

.....

(4 marks)

- (b) Describe how the label would be designed and manufactured using computer-aided design (CAD) and computer-aided manufacturing (CAM) techniques.

Design:

.....

.....

.....

.....

.....

(4 marks)

Manufacture:

.....

.....

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.....

.....

(4 marks)

—
12

TURN OVER FOR THE NEXT QUESTION

Turn over ►

Question 5 is about ergonomics.

You should spend about 10 minutes on this question.

5 Study the gardening tools shown in **Figure 3** on the colour insert sheet.

(a) Explain how anthropometric data has influenced the design of the garden tools.

Explanation:

.....

.....

.....

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.....

.....

(4 marks)

(b) Choose **one** of the garden tools and describe its ergonomic features.

Chosen garden tool:

.....

.....

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(6 marks)

Question 6 is about materials and industrial practice.

You should spend about 5 minutes on this question.

6 Study the garden furniture shown in **Figure 4** on the colour insert sheet.

- (a) Name **one** suitable, **specific** material from which to make garden furniture and give **two** reasons for your choice.

Garden furniture A

Material:
(1 mark)

Reason 1:

Reason 2:
(2 marks)

- (b) **Garden furniture B** has been manufactured by injection moulding.

Explain why this method of manufacture is only suited to large scale production.

Explanation:
.....
.....
.....
.....
.....
.....
(4 marks)



TURN OVER FOR THE NEXT QUESTION

Turn over ▶

Question 7 is about packaging.

You should spend about 15 minutes on this question.

7 Study **garden furniture A** shown in **Figure 4** on the colour insert sheet.

This type of furniture is usually sold as a *flat pack*.

(a) Explain **two advantages** and **one disadvantage** to the **customer** of selling the furniture as *flat pack*.

Advantage 1:

.....

.....

(2 marks)

Advantage 2:

.....

.....

(2 marks)

Disadvantage:

.....

.....

(2 marks)

(b) Explain the advantages to the **manufacturer** of selling the furniture as *flat pack*.

Advantages:

.....

.....

.....

.....

.....

(4 marks)

- (c) Name **two** pieces of information which you would find, in symbol form, on the outside of this type of packaging.

Information 1:
(1 mark)

Information 2:
(1 mark)

- (d) Explain why the information is presented in this format.

Explanation:
.....
.....
.....
.....
.....
.....
(4 marks)

TURN OVER FOR THE NEXT QUESTION

Turn over ►

Question 8 is about industrial processes.

You should spend about 5 minutes on this question.

8 Study **Figure 5** (the seed tray), shown on the colour insert sheet.

- (a) Name **one** suitable, **specific** material from which to make the seed tray.

Material:
(1 mark)

Figure 6 shows a drawing of a former/mould used to vacuum form a similar seed tray to that shown as **Figure 5** on the colour insert sheet.

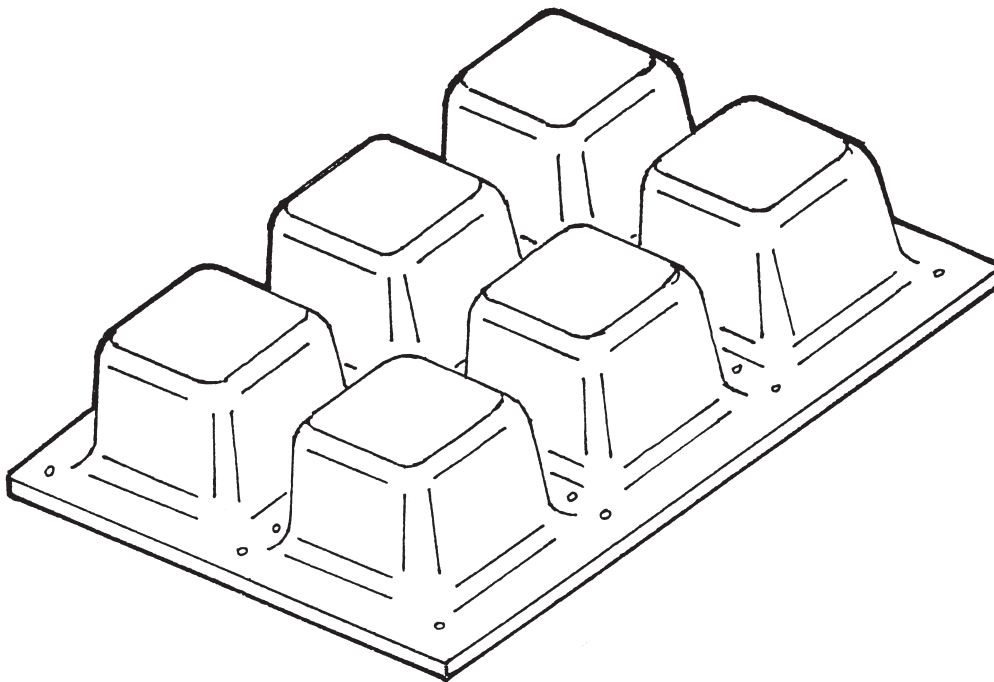


Figure 6

(b) Use arrows and labels to indicate clearly **three** important features of the former / mould.

Explain the function of each feature.

Feature A:
(1 mark)

Explanation:
.....
(2 marks)

Feature B:
(1 mark)

Explanation:
.....
(2 marks)

Feature C:
(1 mark)

Explanation:
.....
(2 marks)

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END OF QUESTIONS

THERE ARE NO QUESTIONS PRINTED ON THIS PAGE

**DESIGN AND TECHNOLOGY
RESISTANT MATERIALS TECHNOLOGY:
Full and Short Courses
Higher Tier**

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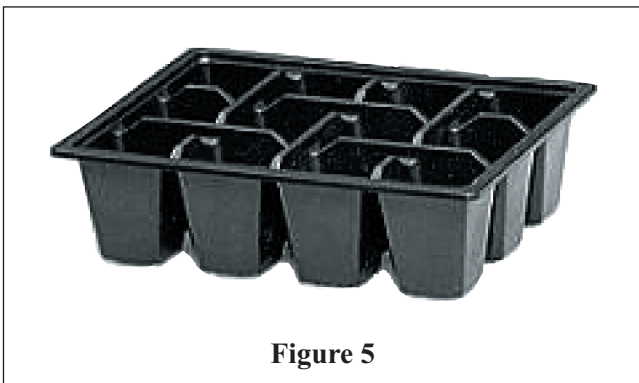
Figure 1 shows a variety of tools, equipment
and products used in gardening.

Figure 1

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Figure 4