

Surname		Other Names	
Centre Number		Candidate Number	
Candidate Signature			

Leave blank
-------------

General Certificate of Secondary Education  
Summer 2003

**DESIGN AND TECHNOLOGY**  
**Resistant Materials Technology (Short Course)**

**3555/F**

**FOUNDATION TIER**

**F**

Tuesday 3 June 2003 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).

Time allowed: 1 hour 30 minutes

**Instructions**

- Write your name and other details in the spaces provided above.
- Answer **all** the questions in the spaces provided.

**Information**

- The maximum mark for this paper is 100.
- An insert of colour images has been provided for use in answering questions in this paper.
- The number of marks is given in brackets at the end of each question or part-question.
- Wherever calculations are needed you should show your working.
- All dimensions are given in millimetres unless otherwise stated.
- You are reminded of the need for good English and clear presentation.

For Examiner's Use			
Number	Mark	Number	Mark
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
Total (Column 1)	→		
Total (Column 2)	→		
TOTAL			
Examiner's Initials			

Questions 1–5 on this paper relate to the Design Brief given below.

### Design Brief

A furniture manufacturer has asked you to design a workstation for the family personal computer, shown below. (See also the colour version in **Figure 1** on the enclosed colour insert sheet).



**Figure 1**

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

**Question 1 is about market research.**

**You should spend about 5 minutes on this question.**

- 1 Give and explain **three** checks that a **customer** should carry out before buying a computer workstation.

Check 1 .....

Explanation .....

.....

.....

*(2 marks)*

Check 2 .....

Explanation .....

.....

.....

*(2 marks)*

Check 3 .....

Explanation .....

.....

.....

*(2 marks)*

6

**TURN OVER FOR THE NEXT QUESTION**

**Turn over ►**

**Question 2 is about using ICT when designing.**

**You should spend about 3 minutes on this question.**

- 2 Give and explain **two** ways in which ICT could be used during the **design** of the computer workstation.  
(An example has been completed for you.)

*Example: By using a spreadsheet.*

*Explanation: This could be used to calculate the cost of the materials.*

1 .....

Explanation .....

.....

*(2 marks)*

2 .....

Explanation .....

.....

*(2 marks)*

4

**Question 3 is about the Design Specification.**

**You should spend about 5 minutes on this question.**

**3** Give **three** design requirements of a computer workstation. Give a reason for each requirement.

(An example has been completed for you.)

*Example*

*Requirement: The workstation should be of a "flat-pack" type construction.*

*Explanation: So that it can be transported easily.*

Requirement 1 .....

Explanation .....

.....  
(2 marks)

Requirement 2 .....

Explanation .....

.....  
(2 marks)

Requirement 3 .....

Explanation .....

.....  
(2 marks)

6

**Turn over ►**

**Question 4 is about design ideas.**

**You should spend about 20 minutes on this question.**

- 4 Study the information given in the **Design brief** and your **Specification** (Question 3). Use this information to help you sketch **two** different design ideas for a computer workstation. Add notes to explain each of your ideas.

This question is worth 21 marks.

Marks will be awarded for:

- two different ideas; *(2 × 6 marks)*
- quality of sketching; *(5 marks)*
- quality of notes. *(4 marks)*

**Idea 1**

**Idea 2**

**Question 5 is about the evaluation and construction of your best idea.**

**You should spend about 10 minutes on this question.**

**5** Choose **one** of your design ideas from **Question 4**.

Chosen idea .....

(a) Explain why you have chosen this idea.

Explanation .....

.....

.....

*(2 marks)*

(b) Using notes and sketches clearly show the **main** method of construction for your chosen idea.

This question is worth 8 marks.

Marks will be awarded for:

- a suitable method of construction; *(4 marks)*
- quality of sketching; *(2 marks)*
- quality of notes. *(2 marks)*

**Question 6 is about health and safety.**

**You should spend about 5 minutes on this question.**

- 6 (a) Melamine-covered-chipboard is a sheet material often used in the construction of cabinets, cupboards, tables and shelves.

Give and explain **two** safety precautions that should be taken when cutting this board with the jigsaw shown as **Figure 2** on the sheet of colour photographs.

Safety precaution 1 .....

Explanation .....

.....  
(2 marks)

Safety precaution 2 .....

Explanation .....

.....  
(2 marks)

- (b) The edging on melamine-covered-chipboard is often applied using a solvent based contact adhesive.

The symbol shown as **Figure 3** on the sheet of colour photographs is a safety marking which you would find on a tin of contact adhesive.

Give the meaning of this safety marking, and explain the precaution you should take when you see this symbol.

**Figure 3**

Meaning.....

.....  
(1 mark)

Precaution .....

.....  
(1 mark)



**Question 7 is about environmental issues.**

**You should spend about 10 minutes on this question.**

7 (a) Give **two** reasons and explain why Pine is considered to be an environmentally friendly material.

Reason 1 ..... (1 mark)

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

Reason 2 ..... (1 mark)

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

(b) Give **two** reasons and explain why Acrylic is considered to be a non-environmentally friendly material.

Reason 1 ..... (1 mark)

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

Reason 2 ..... (1 mark)

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

**Question 8 is about materials and finishes.**

**You should spend about 10 minutes on this question.**

**8** Study the display cabinet shown as **Figure 5** on the sheet of colour photographs.

The display cabinet is being produced by a furniture manufacturer in batches of 500.

- (a) Choose a suitable **specific** material from which to make each part and give **one** reason for your choice.

**Part A (the framework)**

Material ..... (2 marks)

Reason ..... (1 mark)

**Part B (the shelf)**

Material ..... (2 marks)

Reason ..... (1 mark)

- (b) Choose a suitable **specific** finish for each of the materials you have chosen in (a).

**Part A (the framework)**

Finish ..... (1 mark)

**Part B (the shelf)**

Finish ..... (1 mark)

- (c) Give **two** reasons why it is important to apply a finish to **Part A (the framework)**.

Reason 1 .....

Reason 2 ..... (2 marks)

**Question 9 is about components.**

**You should spend about 5 minutes on this question.**

- 9 (a) Below is a list of some of the parts used to make the display cabinet shown as **Figure 5** on the sheet of colour photographs.

- |                |                   |                        |                        |
|----------------|-------------------|------------------------|------------------------|
| <b>shelves</b> | <b>legs</b>       | <b>framework</b>       | <b>back of cabinet</b> |
| <b>hinges</b>  | <b>light bulb</b> | <b>electrical wire</b> |                        |

Place a circle around each of the **four** parts which a manufacturer is most likely to have bought from another supplier, rather than manufacture themselves.

*(4 marks)*

- (b) Give **one** reason and explain why a furniture manufacturer would choose to buy these parts from another supplier rather than manufacture the parts themselves.

Reason .....

Explanation .....

.....

*(2 marks)*



**TURN OVER FOR THE NEXT QUESTION**

**Turn over ►**

**Question 10 is about making.**

**You should spend about 9 minutes on this question.**

**10** Study **Figure 5** on the sheet of colour photographs.

In the development of the display cabinet a prototype of the leg shown as **Part C (the metal leg)** was made in **sheet acrylic** in a workshop.

(a) Complete the table below by naming **one** tool which would be used in each process.

This question is worth 6 marks.

Process	Tools
Marking out	
Cutting	
Shaping	
Drilling	
Bending	
Cleaning and finishing	

A batch of 500 display cabinets is to be made by a furniture manufacturer.

(b) Explain why the furniture manufacturer would use computer-aided manufacturing techniques (CAM).

Explanation .....

.....

.....

.....

.....

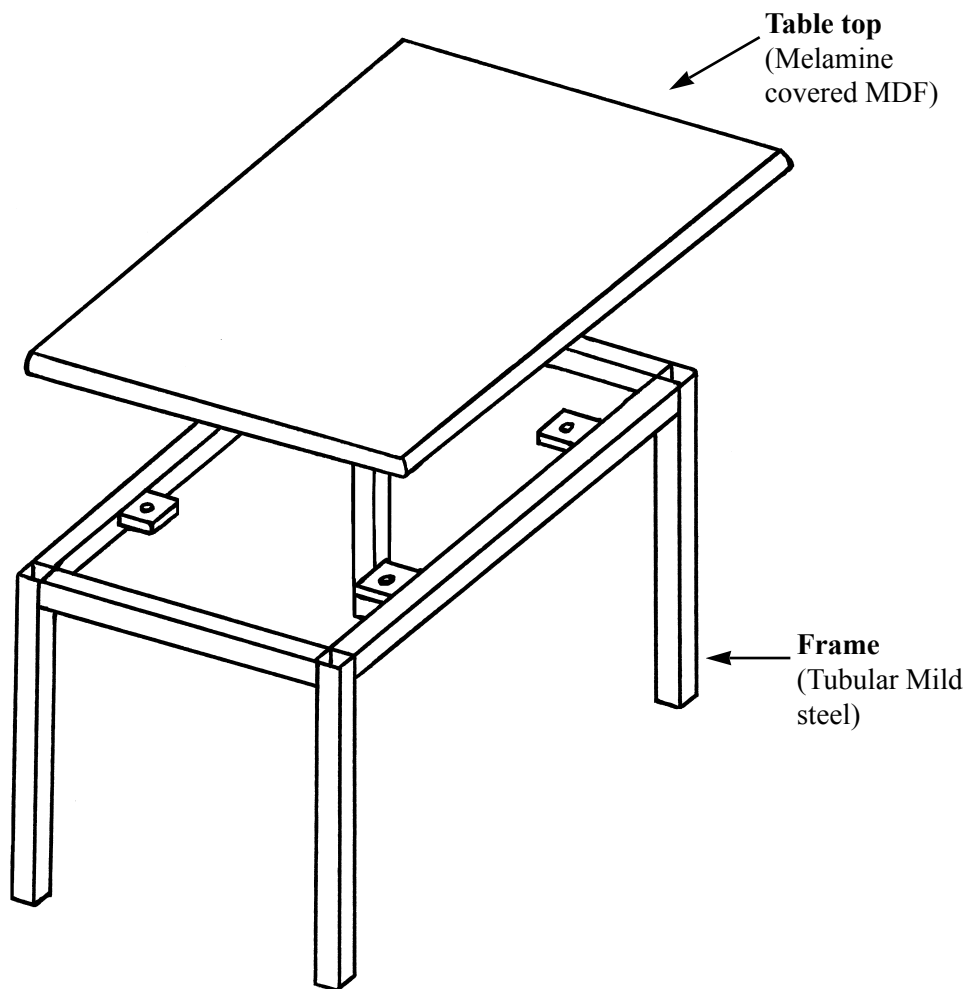
.....

(4 marks)

Question 11 is about materials and making.

You should spend about 8 minutes on this question.

11 Study the exploded drawing of the frame and tabletop shown as **Figure 6** below.



**Figure 6**

Complete the chart below to show the stages in the process of joining the table top to the frame.

Name **one** tool in each process.

This question is worth 9 marks.

Process	Tool
<p style="text-align: center;">Marking out</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p style="text-align: right;"><i>(2 marks)</i></p>	<p>.....</p> <p>.....</p> <p style="text-align: right;"><i>(1 mark)</i></p>
<p style="text-align: center;">Preparation</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p style="text-align: right;"><i>(2 marks)</i></p>	<p>.....</p> <p>.....</p> <p style="text-align: right;"><i>(1 mark)</i></p>
<p style="text-align: center;">Fixing</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p style="text-align: right;"><i>(2 marks)</i></p>	<p>.....</p> <p>.....</p> <p style="text-align: right;"><i>(1 mark)</i></p>

**END OF QUESTIONS**