

Candidate Name	Centre Number	Candidate Number

WELSH JOINT EDUCATION COMMITTEE  
General Certificate of Secondary Education



CYD-BWYLLGOR ADDYSG CYMRU  
Tystysgrif Gyffredinol Addysg Uwchradd

141/04

**DESIGN AND TECHNOLOGY**

**PAPER 2**

**FOCUS AREA: RESISTANT MATERIALS TECHNOLOGY**

(Higher Tier – Grades D to A\*)

P.M. TUESDAY, 5 June 2007

(1½ hours)

	<b>Leave Blank</b>
<b>Question 1</b>	
<b>Question 2</b>	
<b>Question 3</b>	
<b>Question 4</b>	
<b>Question 5</b>	
<b>TOTAL MARK</b>	

**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.

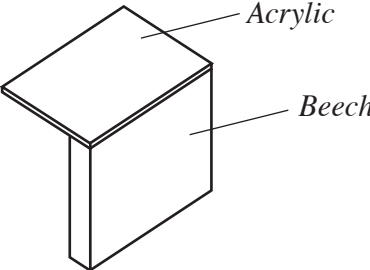
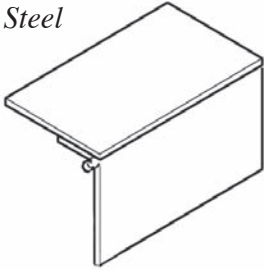
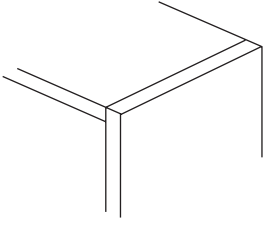
**INFORMATION FOR CANDIDATES**

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) Name **one** permanent and **one** temporary method of joining the parts in **each** of the examples shown below. **Each** method can only be used once. [6]

<i>Part</i>	<i>Temporary</i>	<i>Permanent</i>
 <p>Acrylic</p> <p>Beech</p>		
<p>Mild Steel</p> 		
<p>MDF</p>  <p>12mm thickness</p>		

- (b) Name **two** different types of steel.

(i) ..... [1]

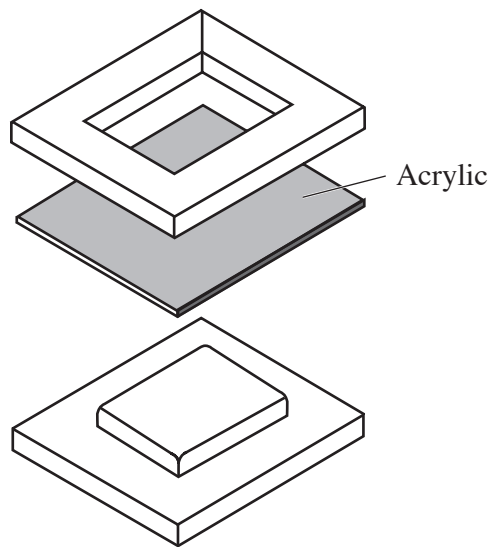
(ii) ..... [1]

(c) (i) Acrylic and foamex are commonly used thermoplastics. Name **two** other thermoplastics.

(I) ..... [1]

(II) ..... [1]

(ii) A mould used for press moulding 3mm acrylic or foamex is shown below.



Study the diagram and describe **three** design features which are necessary to make a successful mould.

Feature 1: ..... [2]

Feature 2: ..... [2]

Feature 3: ..... [2]

(iii) Name a suitable specific material for making the mould and give a reason for your answer.

Material: ..... [1]

Reason: ..... [2]

2. The photograph below shows a computer workstation sold in a retail store.



(a) Give **four** specification points the designer would have considered before designing the product.

Specification point 1: .....  
..... [2]

Specification point 2: .....  
..... [2]

Specification point 3: .....  
..... [2]

Specification point 4: .....  
..... [2]

(b) The workstation is made from *laminated chipboard*. Explain what you understand by the term *laminated chipboard*. [3]

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

(c) Using notes and sketches, explain how you could make the keyboard shelf slide in and out. [4]

(d) Mass produced furniture is often manufactured using CAM machinery. Describe **two** advantages to the manufacturer of using such equipment.

Advantage 1: .....  
..... [2]

Advantage 2: .....  
..... [2]

3. The photograph below shows a toy suitable for children aged 1 and over.



(a) The toy is made of solid wood. Name a suitable wood and give a reason for your choice.

Wood: ..... [1]

Reason: .....

..... [2]

(b) The wheels of the toy turn freely so that the child can pull the toy along. Using notes and sketches, show how you would attach the wheels to the body of the toy. [4]

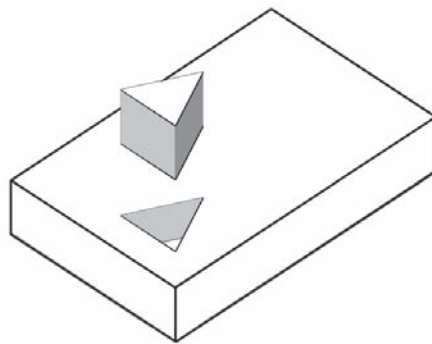
(c) Describe **three** features the designer should incorporate in the toy in order to make it safe for children.

Feature 1: .....  
..... [2]

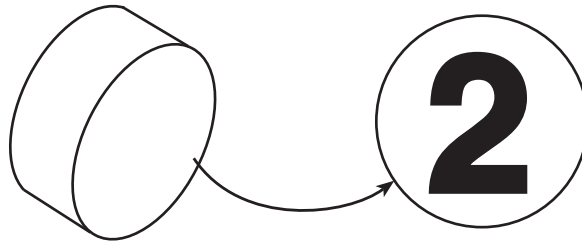
Feature 2: .....  
..... [2]

Feature 3: .....  
..... [2]

(d) Other than using a CAM machine, use notes and/or sketches to explain the stages you would follow to make the triangular hole in the body of the toy. [4]



- (e) The manufacturer wants to put numbers on the wheels of the toy as shown below. The numbers will be drawn using CAD and made using CAM.



Using a named CAM machine, describe the stages involved in using CAM to put the numbers on the wheels. [4]

Name of machine .....

Stages .....

.....

.....

.....

.....

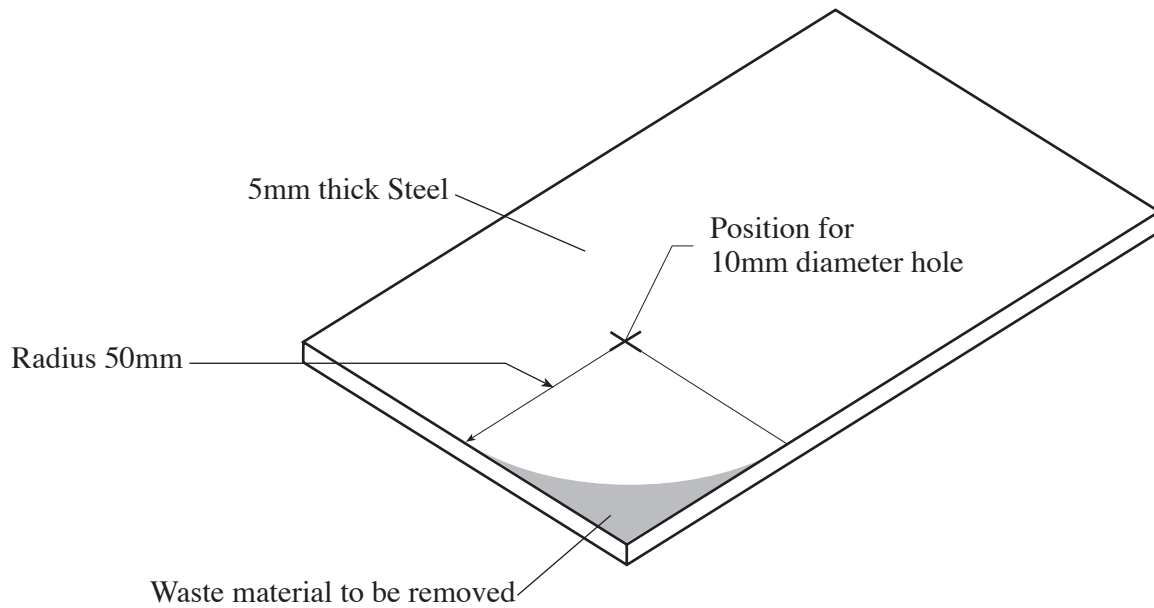
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4. (a) The diagram below shows a 5mm thick piece of steel marked out for drilling and shaping.



- (i) Name the tool used to mark the centre of the 50mm radius.

.....

[1]

- (ii) Name the tool used to mark out the 50mm radius curve.

.....

[1]

- (iii) Using notes and sketches, explain how you would remove the waste material and finish the radius. [4]

(iv) Explain how you would accurately and safely drill the 10mm hole in the steel. [4]

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

(b) (i) Name a specific piece of CAD software you have used in your Design and Technology project work. [1]

.....

(ii) Describe the advantages of using this software in your project. [3]

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

(c) CAM is used extensively in industry. Give **two** disadvantages to the manufacturer of changing to a CAM system for making their products.

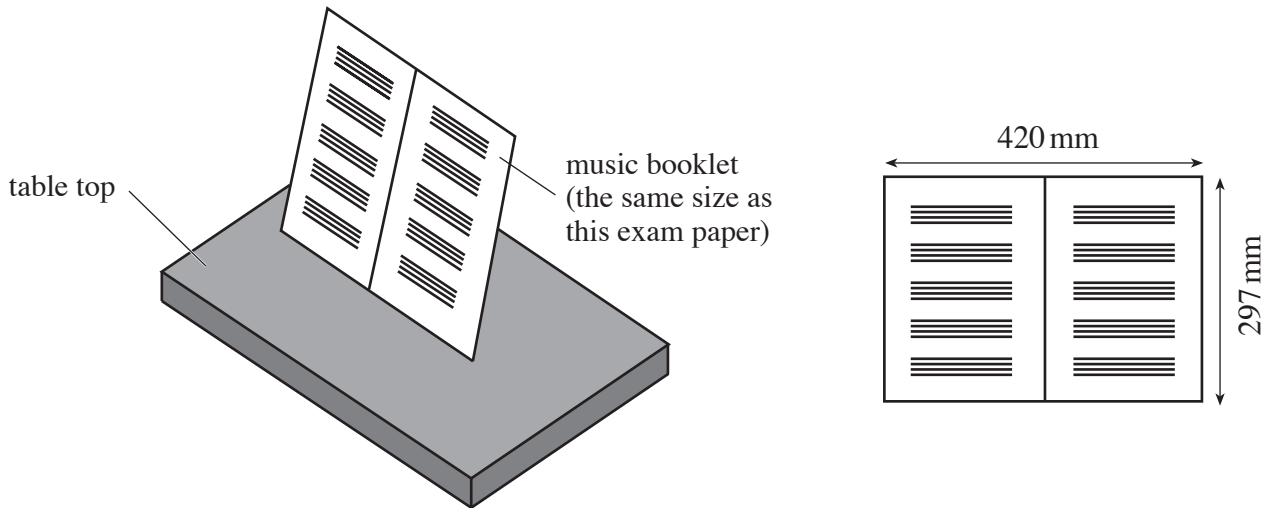
Disadvantage 1: .....

..... [1]

Disadvantage 2: .....

..... [1]

5. The music department in your school has asked you to design a portable table top stand to hold sheet music for use when playing instruments.



### Specification

The design must:

- be portable, stable and suitable for table top use;
- hold an A4 music booklet;
- enable the music to be easily read when playing an instrument;
- be able to be stored in a small space.

(a) **Sketch** your solution on the opposite page.

### Marks will be awarded for:

- |   |     |
|---|-----|
| (i) the design of a stand that is stable;                       | [3] |
| (ii) the design of a stand that can be stored in a small space; | [3] |
| (iii) constructional details of the stand;                      | [5] |
| (iv) showing how the sheet music stays securely in place;       | [3] |
| (v) <b>two</b> important dimensions;                            | [2] |
| (vi) quality of communication.                                  | [4] |

**Turn over for part (b)**

- (b) The music department has asked for twenty identical stands. Use notes and sketches to explain how you would ensure all the stands are identical. [5]

