Candidate Name	Centre Number	Candidate Number

WELSH JOINT EDUCATION COMMITTEE

General Certificate of Secondary Education

CYD-BWYLLGOR ADDYSG CYMRU

Tystysgrif Gyffredinol Addysg Uwchradd

141/02

DESIGN AND TECHNOLOGY

PAPER 2

FOCUS AREA: RESISTANT MATERIALS TECHNOLOGY

(Foundation Tier – Grades G to C)

P.M. TUESDAY, 5 June 2007

(1½ hours)

	Leave Blank
Question 1	
Question 2	
Question 3	
Question 4	
Question 5	
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.

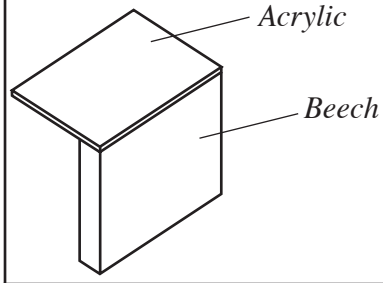
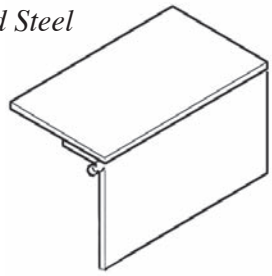
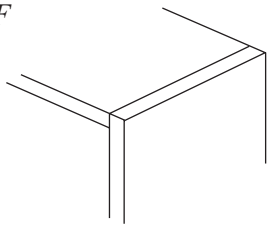
No certificate will be awarded to a candidate detected in any unfair practice during the examination.

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

1. *(a)* When joining materials together, joints can be temporary or permanent. From the list below, **select** the *most suitable* permanent and temporary joint for **each** of the following parts. Use **each** method only once. [6]

Screw **Rivet** **Nut and bolt** **Lap joint**

Knock down fitting (KDF) **Epoxy resin glue (Araldite)**

Part	***Temporary*** **(can be taken apart)**	***Permanent*** **(cannot be taken apart)**
		
Mild Steel 		
MDF  12 mm thickness		

(b) **Use** the following words to **complete** the sentences below.

Iron **Mild Steel** **Brass** **Stainless Steel** **Lead**

(i) All **ferrous** metals contain ..... . [1]

(ii) **Cutlery** is often made from ..... . [1]

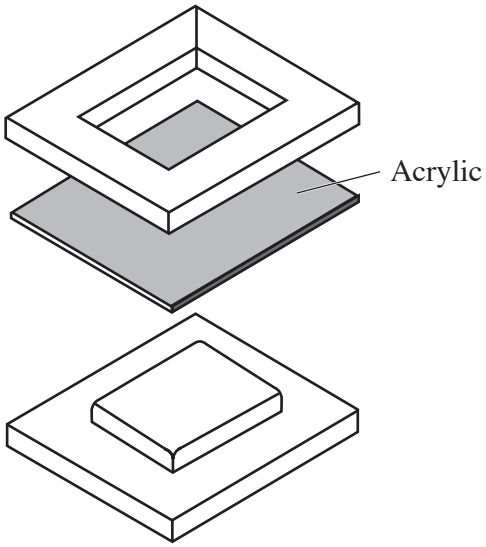
(iii) ..... is an example of a **non ferrous** metal. [1]

(iv) ..... is a very heavy metal with a low melting point. [1]

(c) Acrylic and foamex are commonly used thermoplastics. From the list below, **underline two** other thermoplastics. [2]

GRP (glass reinforced plastic) **Polystyrene** **Melamine Formaldehyde** **Nylon**

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



(i) **Study** the diagram and **describe** any **two** features necessary to make a successful mould.

Feature 1: .....

..... [2]

Feature 2: .....

..... [2]

(ii) **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 desk.

(a) **Give three** specification points the designer would need to think about before designing the computer desk. *One example has been done for you.*

Example of specification point: *All parts of an average personal computer system must fit into or on the desk.*

(i) Specification point 1: .....

..... [2]

(ii) Specification point 2: .....

..... [2]

(iii) Specification point 3: .....

..... [2]

(b) **Name** a suitable manufactured (man-made) board that could be used to make the desk.

..... [1]

(c) Using notes and sketches, **explain** how you could make the keyboard shelf slide in and out. [5]

(d) **Give two** reasons why most computer desks are sold *'flat packed'*.

Reason 1: .....

..... [2]

Reason 2: .....

..... [2]

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

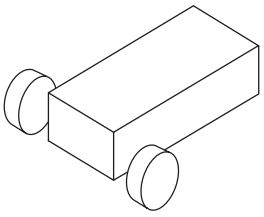
(a) The toy is made of solid wood. **Name** a suitable wood and **give one** reason for your choice.

Wood: ..... [1]

Reason: .....

..... [2]

(b) The wheels of the toy need to turn freely so that it can be pulled along. In the box provided, use notes and sketches to **show** how the wheels could be attached to the body. [5]



(c) **Describe two** safety features the designer should use in order to make the toy safe for children.

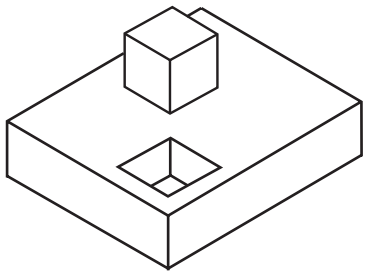
Safety feature 1: .....

..... [2]

Safety feature 2: .....

..... [2]

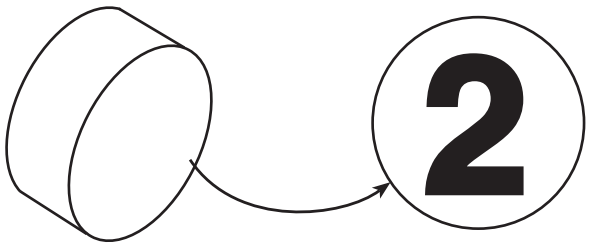
(d) (i) Other than using a CAM machine, use notes and/or sketches to **explain** the stages you would follow to make the square hole in the body of the toy. [4]



(ii) **Name two** tools you could use to make the hole in the body of the toy.

.... [2]

(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.



(i) **Complete** the following :

Computer Aided D ..... [1]

Computer Aided M ..... [1]

(ii) **Name** a suitable CAM machine for making the numbers.

..... [1]

(iii) **Describe** the stages involved in using CAM to put the numbers on the wheels. [4]

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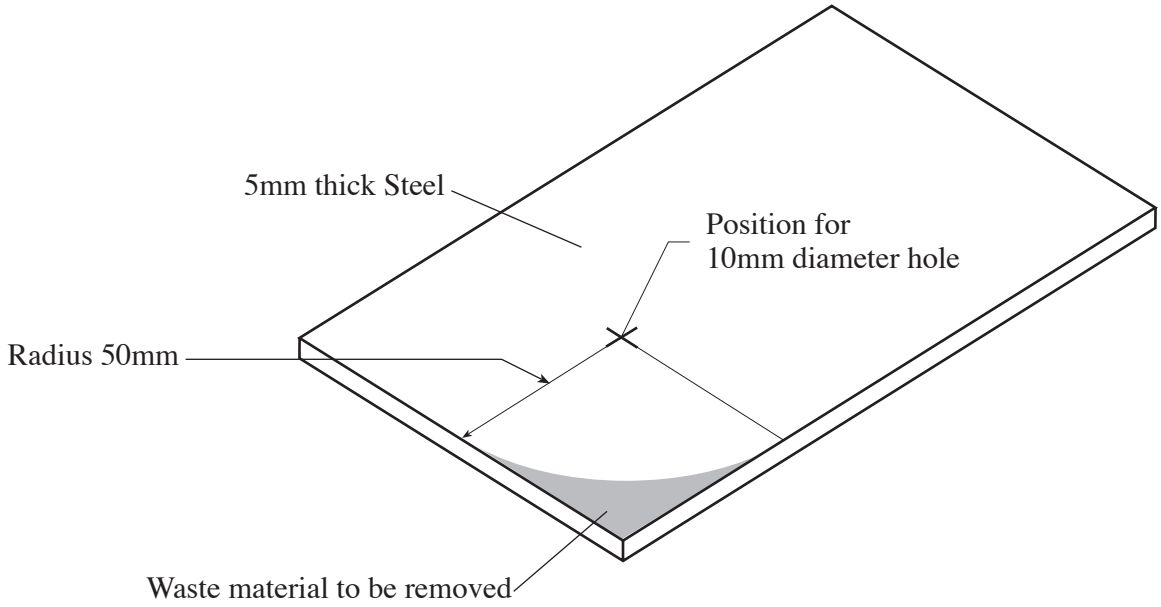
4. The diagram below shows a 5mm thick piece of steel marked out for drilling and shaping.



(a) Using notes and sketches, **explain** how you would remove the waste material and finish the curve. [4]

(b) **Complete** the table below by describing **three** important stages you would follow when drilling a 10mm hole in steel. [3]

Stage	*Description*
1	.....
2	.....
3	.....

(c) **List four** safety precautions that should be followed when drilling metal.

(i) ..... [1]

(ii) ..... [1]

(iii) ..... [1]

(iv) ..... [1]

(d) (i) **Name** a type 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]

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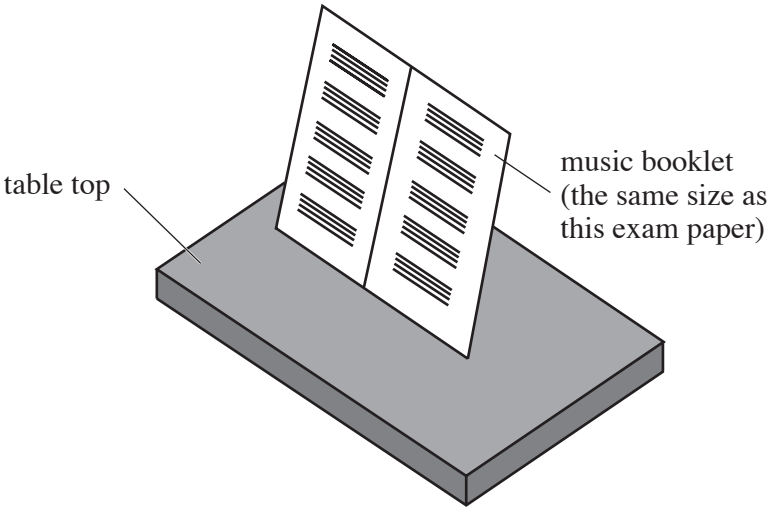
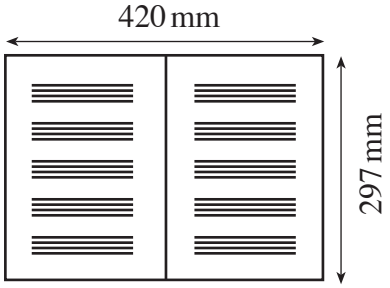
5. The music department in your school has asked you to design a portable table top stand to hold sheet music for use when playing instruments.





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.

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

Marks will be awarded for:

(i)	the design of a stand that is stable;	[4]
(ii)	full details of how the stand is constructed;	[6]
(iii)	showing how the sheet music stays securely in place;	[3]
(iv)	**two** important dimensions;	[2]
(v)	quality of communication.	[5]

Turn over for part *(b)*

(b) **Name** a material you have used in the design of your music stand and give **two** reasons why this material is suitable.

Material: ..... [1]

Reason 1: .....

..... [2]

Reason 2: .....

..... [2]

For continuation only