

OXFORD CAMBRIDGE AND RSA EXAMINATIONS
GCSE
A565/01
DESIGN AND TECHNOLOGY
Resistant Materials
Sustainability and Technical Aspects of
Designing and Making
FRIDAY 16 JUNE 2017: Afternoon
DURATION: 1 hour 30 minutes
plus your additional time allowance
MODIFIED ENLARGED 24pt

Candidate forename		Candidate surname	
Centre number			

Candidates answer on the Question Paper.

OCR SUPPLIED MATERIALS:
None

OTHER MATERIALS REQUIRED:
None

READ INSTRUCTIONS OVERLEAF

INSTRUCTIONS TO CANDIDATES

Write your name, centre number and candidate number in the boxes on the front page. Please write clearly and in capital letters.

Use black ink. HB pencil may be used for graphs and diagrams only.

Answer ALL the questions in Section A AND B.

Read each question carefully. Make sure you know what you have to do before starting your answer.

Write your answer to each question in the space provided. If additional space is required, you should use the lined page(s) at the end of this booklet. The question number(s) must be clearly shown.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets [] at the end of each question or part question.

The total number of marks for this paper is 80.

Your quality of written communication is assessed in questions marked with an asterisk (*).

Dimensions are in millimetres unless stated otherwise.

SECTION A

Answer ALL the questions.

You are advised to spend 40 minutes on this section.

On questions 1–5 circle your answer.

1 Which of the following is one of the 6Rs?

(a) Readjust

(b) Resolve

(c) Reuse

(d) Respond

[1]

2 Biodegradable materials will:

(a) Rust

(b) Get stronger

(c) Remain the same

(d) Break down naturally

[1]

3 An example of a non-renewable energy source is:

- (a) Biofuel**
 - (b) Coal**
 - (c) Hydro-electricity**
 - (d) Solar**
- [1]**

4 COSHH (Control of Substances Hazardous to Health) is connected to:

- (a) Product analysis**
 - (b) Risk assessment**
 - (c) Market research**
 - (d) Design development**
- [1]**

5 Carbon offsetting requires companies to purchase:

- (a) Carbon credits**
 - (b) Fairtrade materials**
 - (c) Recycled packaging**
 - (d) Local labour**
- [1]**

6 The letters E T I stand for:

Ethical T_____
Initiative [1]

7 State the meaning of the logo shown here.



_____ [1]

8 Tick (✓) the final stage of a life cycle analysis. [1]

Disposal	Distribution	Product Use

9 Peoples’ beliefs and way of life are referred to as:

Their C_____ [1]

10 State the term given to the study of people’s body sizes.

_____ [1]

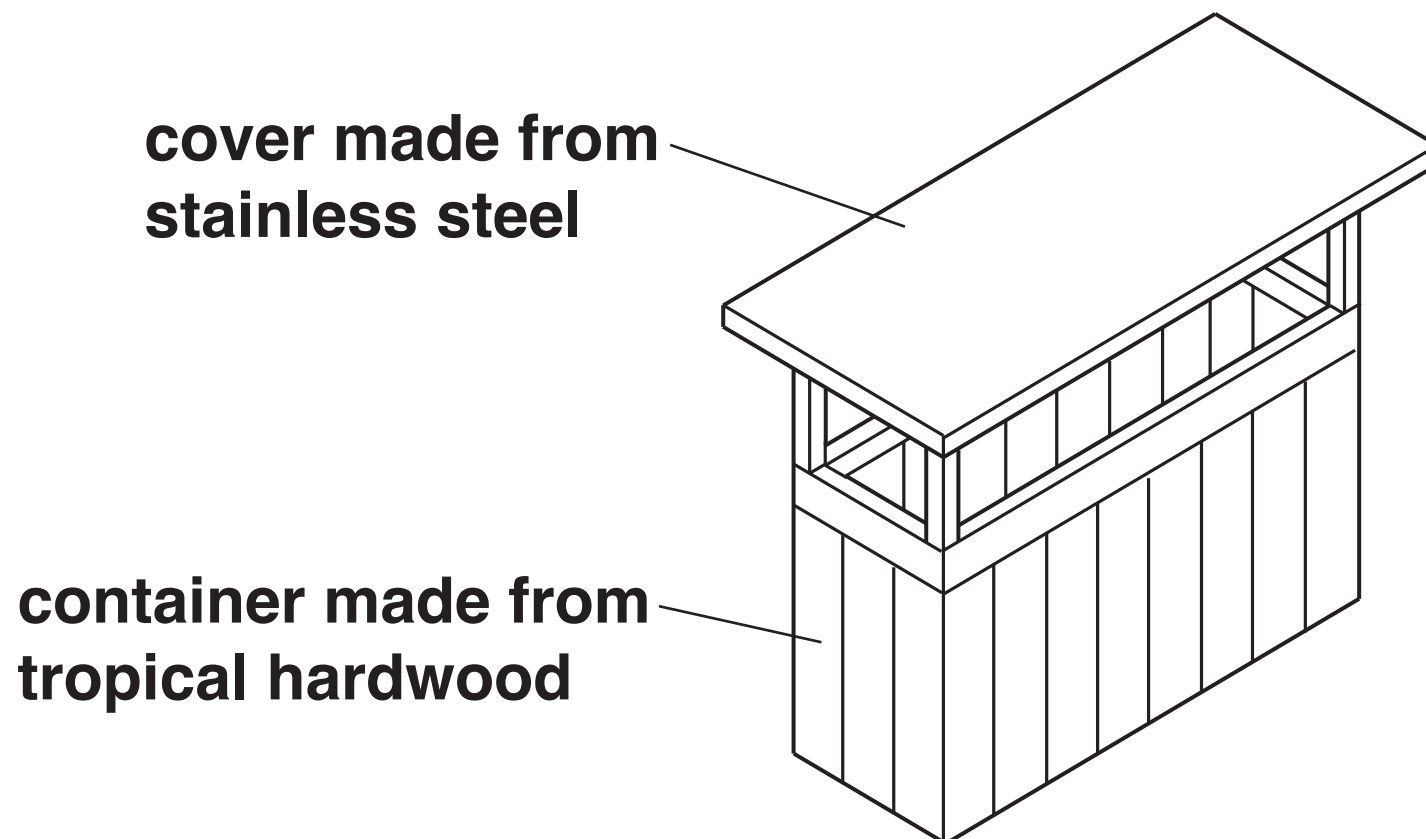
Decide whether each of the following statements is TRUE or FALSE.

Tick (✓) the box to show your answer.

	TRUE	FALSE	
11 A BSI kitemark™ confirms that a product has been tested.	<input type="checkbox"/>	<input type="checkbox"/>	[1]
12 Tertiary recycling is using a product again for the same purpose.	<input type="checkbox"/>	<input type="checkbox"/>	[1]
13 Fairtrade promotes cheaper products.	<input type="checkbox"/>	<input type="checkbox"/>	[1]
14 Aesthetics relates to the appearance of a product.	<input type="checkbox"/>	<input type="checkbox"/>	[1]
15 CFCs harm the ozone layer.	<input type="checkbox"/>	<input type="checkbox"/>	[1]

16 Fig. 1 shows a waste bin that is to be used in a school playground.

FIG. 1



- (a) Give ONE method of gathering information about the target market that might have been used before the waste bin was designed.

_____ [1]

- (b) With reference to the waste bin shown in Fig. 1 explain the meaning of the following:

(i) the term 'disassembly' _____

_____ [2]

(ii) the 6R ‘refuse’ _____

_____ **[2]**

(c) The container of the waste bin is protected by a clear finish.

(i) State ONE reason for using a clear finish on the container.
_____ **[1]**

(ii) Give TWO benefits of using a finish with LVOC (low volatile organic compound) content.

1 _____
2 _____ **[2]**

(d) A large plastic bin bag is used to line the container of the waste bin.

Explain why an alternative to using plastic bags should be considered.

_____ **[2]**

(e) Different types of rubbish become mixed together in the waste bin. It is also difficult to empty.

Use sketches and notes to show modifications to the waste bin to make the recycling of waste easier.

The waste bin must:

be easy to empty

be made from sustainable and/or recyclable materials

have easily identifiable compartments for both general waste and recyclable waste. [4]

[illegible]

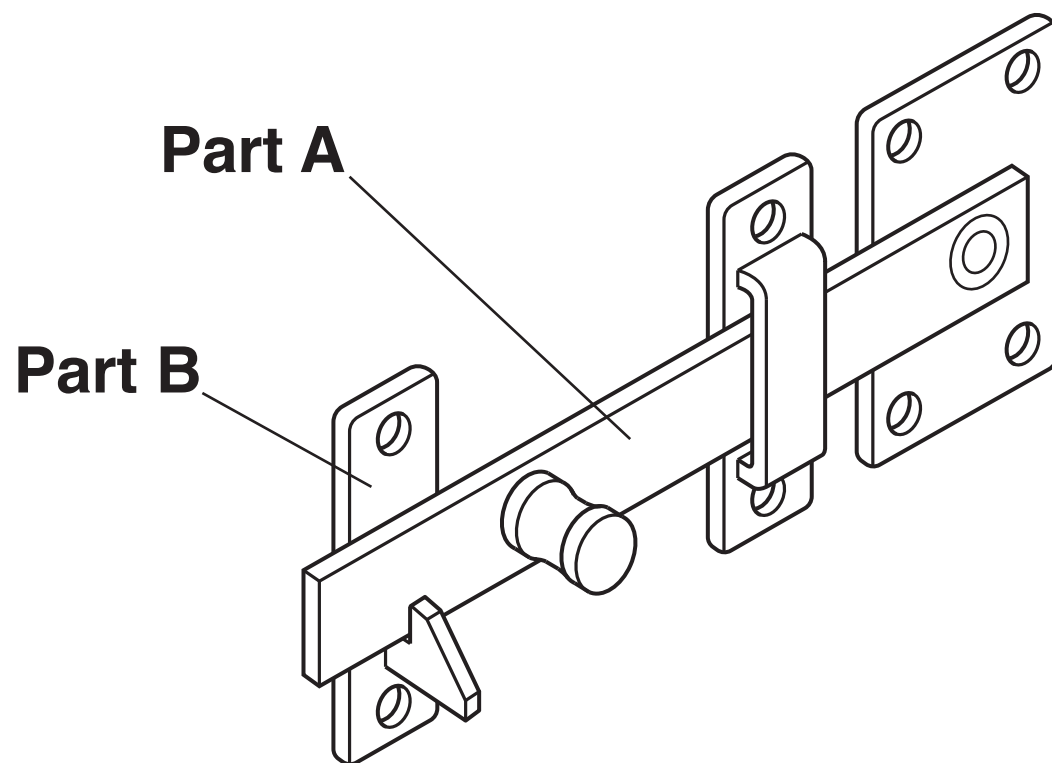
SECTION B

Answer ALL the questions.

You are advised to spend 50 minutes on this section.

17 Fig. 2 shows a mild steel gate latch.

FIG. 2



(a) State ONE property of mild steel that makes it a suitable material for the gate latch.

_____ [1]

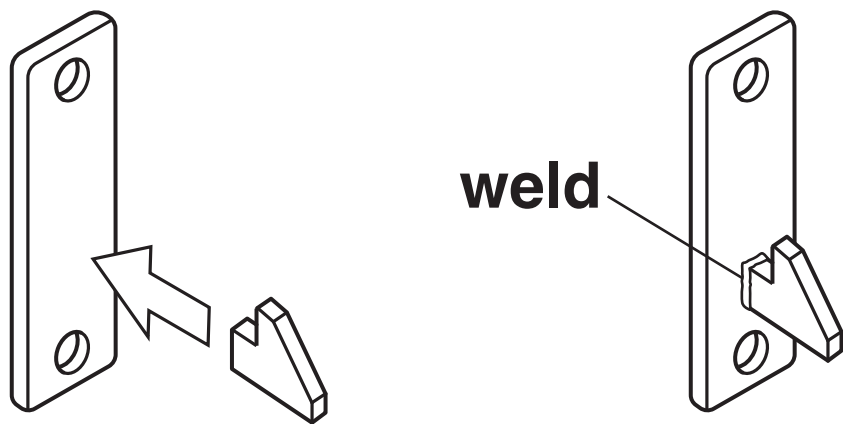
(b) Part A of the gate latch (the latch arm) is made from a length of flat mild steel bar.
 The table below shows the processes used to manufacture the latch arm.

Complete the table below by stating ONE tool or item of equipment for each process. [4]

Process	Tool or item of equipment
Cutting the bar to length	
Smoothing the edges	
Marking the pivot hole position	
Making the pivot hole	

(c) Fig. 3 shows Part B of the gate latch, made from two pieces of mild steel welded together.

FIG. 3



State ONE other method of permanently joining the two pieces together.

_____ [1]

(d) The gate latch has a spray painted finish.

(i) State ONE reason why the gate latch is painted.

_____ **[1]**

(ii) State ONE safety precaution that should be taken when spray painting.

_____ **[1]**

(iii) State ONE other suitable method of finishing the gate latch, apart from painting.

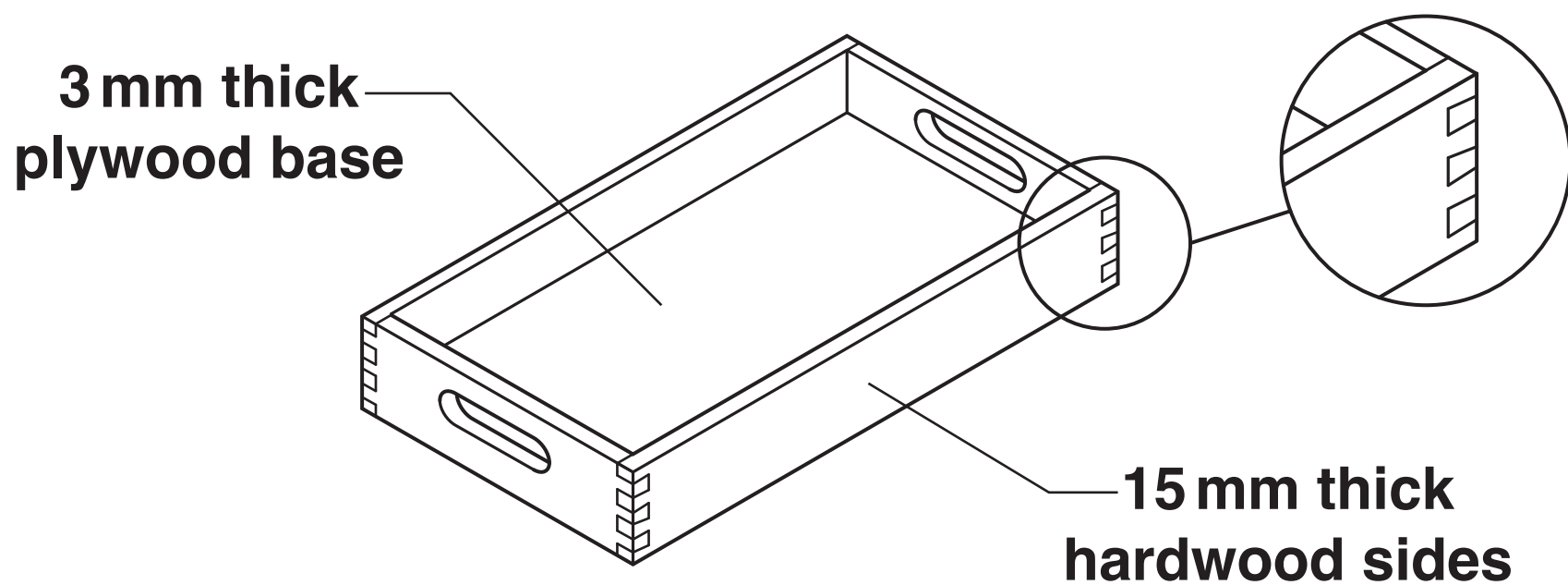
_____ **[1]**

(e)* The gate latch could be produced by different production methods.

Discuss the advantages and disadvantages of one-off production compared to mass production methods. [6]

18 Fig. 4 shows a wooden tray.

FIG. 4



(a) Name the type of joint used on the corners of the tray.

_____ [1]

(b) Name a suitable adhesive for securing the joints on the corners of the tray.

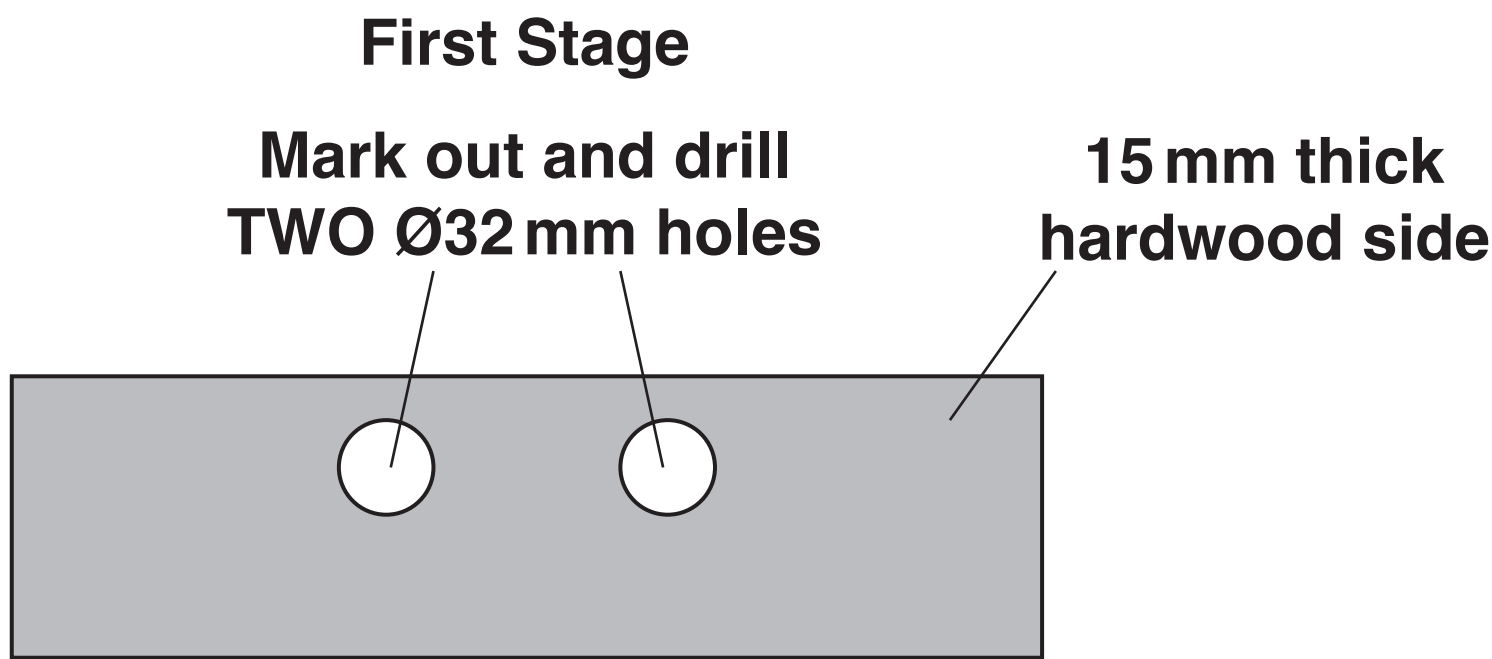
_____ [1]

(c) Name a suitable hardwood for the sides of the tray.

_____ [1]

(d) The cut out handles on the sides of the tray are made in three stages.
Fig. 5 shows the first stage.

FIG. 5



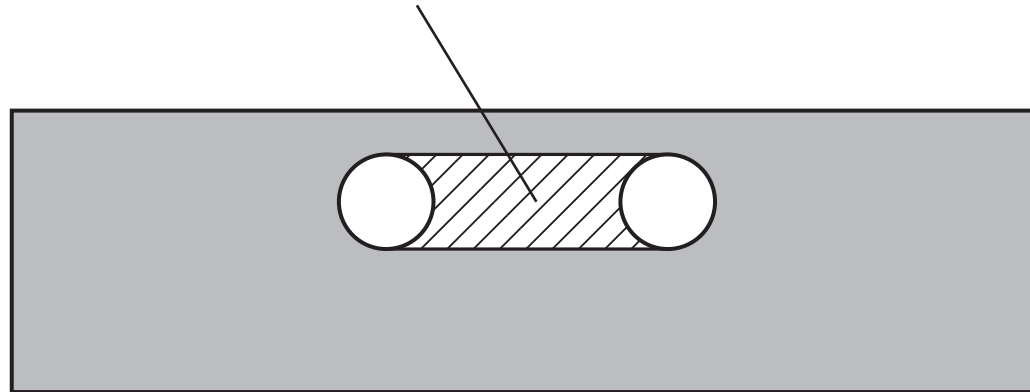
Tick (✓) the most suitable drill bit for making the holes. [1]

Masonry bit	HSS bit	Countersink bit	Forstner bit

(e) Fig. 6 shows the second stage.

FIG. 6

Second Stage
Remove the material between the two holes



Explain ONE method of removing the material shown using workshop hand tools.

[3]

(f) The base of the tray is made from plywood. Plywood is a manufactured board.

(i) Name ONE other manufactured board.

[1]

(ii) Give ONE advantage, other than cost, of using plywood for the base of the tray compared to solid timber.

[1]

(g) The tray could be made easier to use for some children.

Use sketches and notes to show ONE design for a modified tray. Include details of materials and methods of construction used.

The tray must:

hold cups and plates securely in place

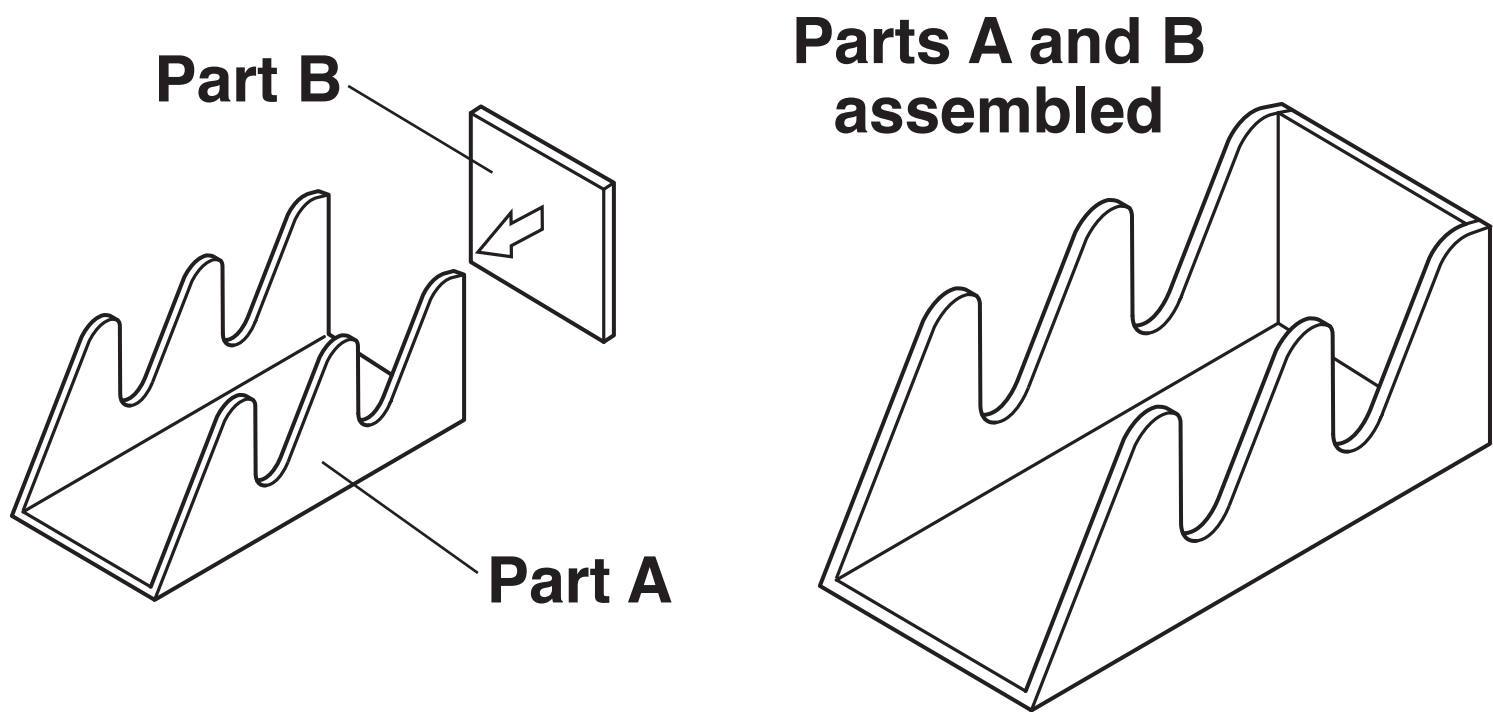
be easier to clean

be easier to carry

be safer for a child to use. [6]

19 Fig. 7 shows a games controller holder made from 3 mm thick acrylic. The holder is made in two parts.

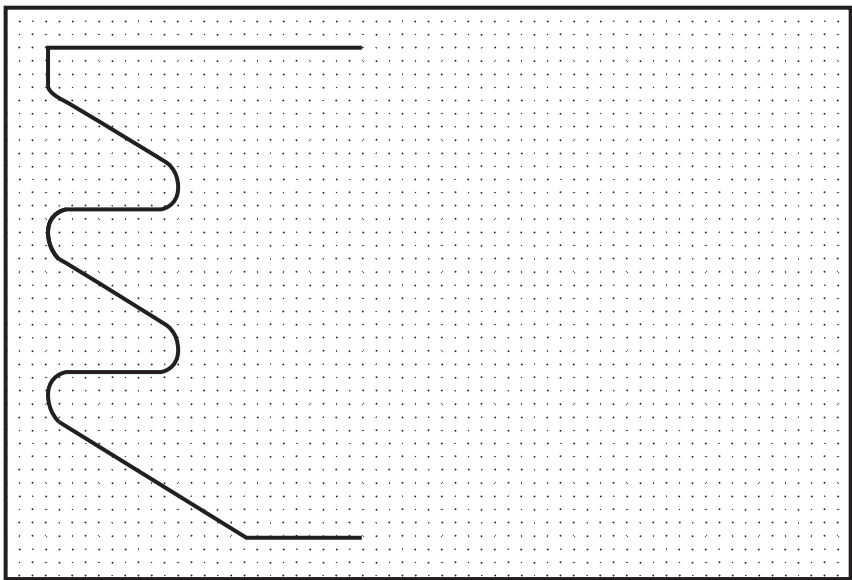
FIG. 7



(a) The two parts are to be designed and made using CAD/CAM. What do the letters CAD stand for?

(i) C_____ A_____ Design [1]

(ii) The screen shot shown below shows an incomplete CAD drawing of Part A.



Tick (✓) the command you would use to complete the drawing of part A. [1]

Copy	Stretch	Mirror	Group

(b) The parts will be cut out using CAM.

State a suitable CAM machine for cutting out parts A and B.

_____ **[1]**

(c) CAD/CAM can be quicker and easier than using hand tools.

Give TWO other advantages of using CAD/CAM to cut out the acrylic Parts A and B compared to using hand tools.

1 _____

2 _____

_____ **[2]**

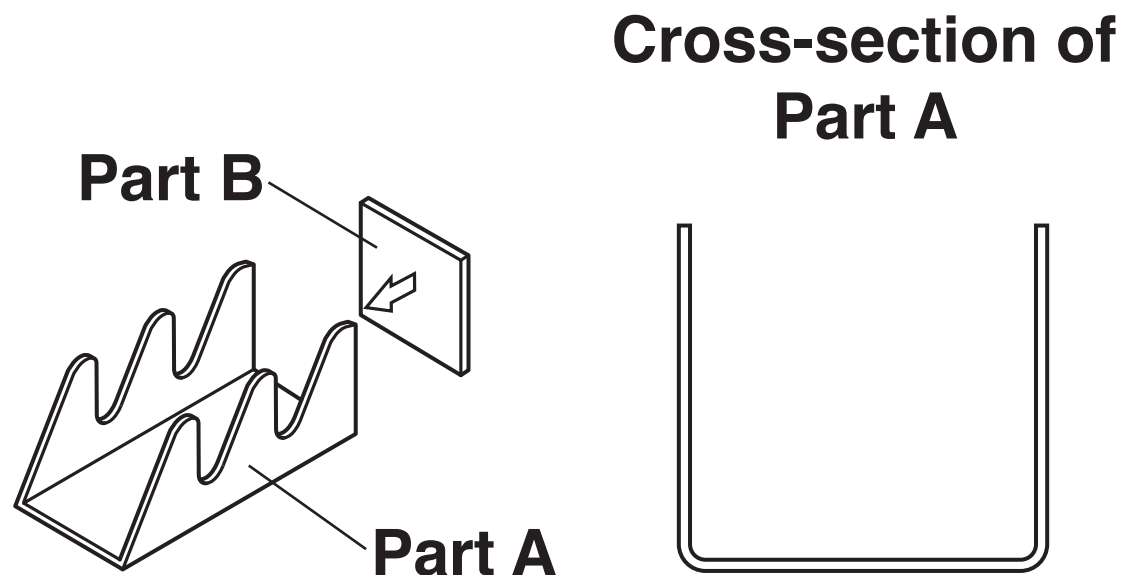
(d) After being cut out, Part A needs to be bent into a U shape.

Use sketches and notes to show the stages involved in bending Part A accurately and safely into the correct U shape.

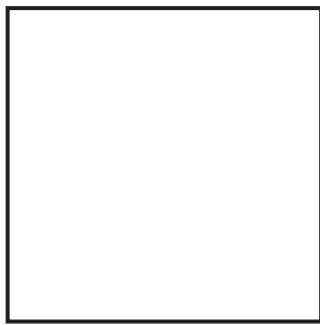
Show details of all tools, materials, techniques and safety precautions used. [5]

- (e) Fig. 8 shows a cross-section of Part A after bending to shape.
The shape of Part B requires some modification to make it fit snugly into Part A.

FIG. 8



- (i) Sketch ONE modification of Part B onto the drawing below to allow it to fit into Part A. [1]



- (ii) Explain how you would make this modification to Part B using workshop hand tools.

[2]

- (f) Name a suitable adhesive for fixing Part B into Part A.

[1]

(g) Name ONE thermoplastic, other than acrylic, that could be used to make the games controller holder.

[1]

END OF QUESTION PAPER

ADDITIONAL ANSWER SPACE

If additional space is required, you should use the following lined page(s). The question number(s) must be clearly shown in the margin(s).

[illegible]

