

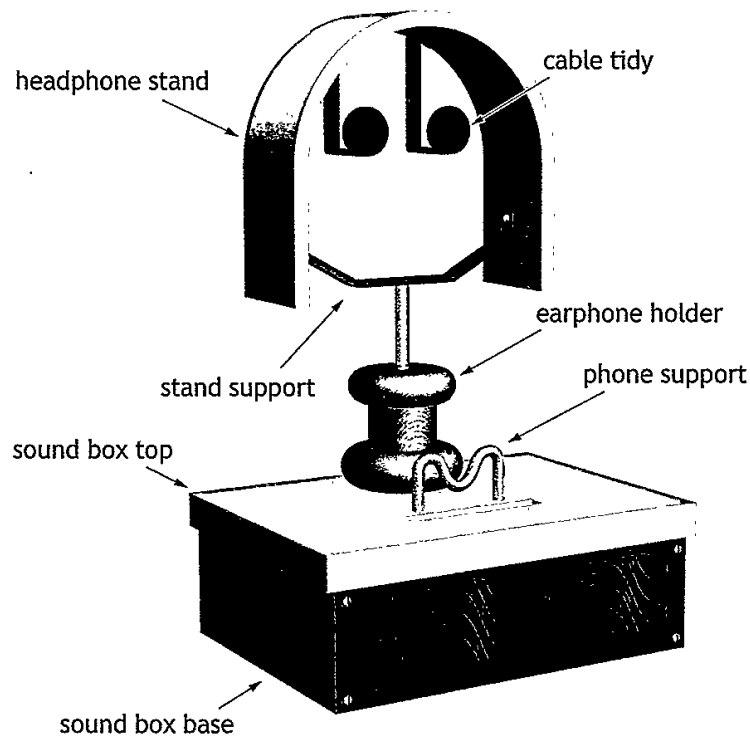
Candidate 4

SECTION 1 — 60 marks

Attempt ALL questions

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1. A design proposal for a sound box with a phone and accessory holder is shown below.



- (a) The sound box top was made from softwood.

- (i) Name a suitable softwood for the sound box top.

1

Scots pine.

The sound box base was made from MDF.

- (ii) State a benefit of using MDF rather than softwood.

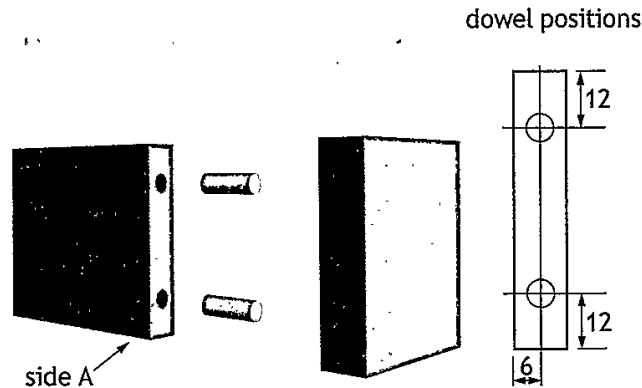
1

It's cheaper than other woods

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1. (continued)

(b) Dowel joints were used to join the sides of the sound box together.

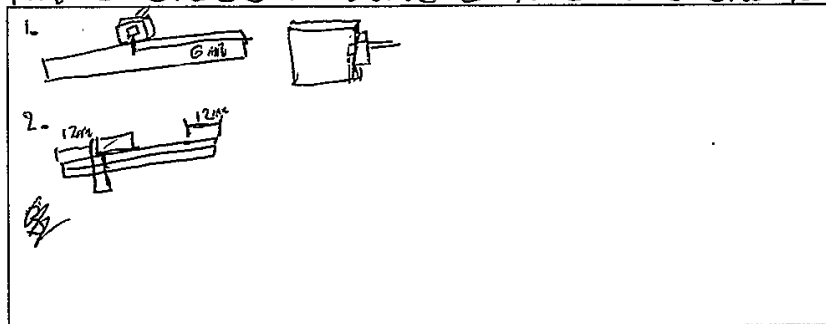


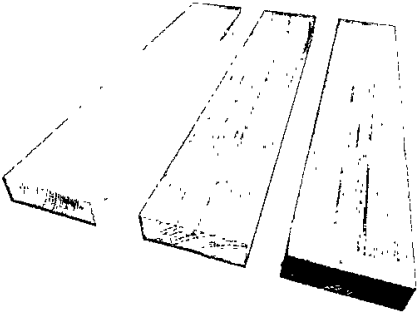
- (i) Describe how to mark out the positions of the dowel holes on side A, with reference to workshop tools.

2

You may use sketches to illustrate your answer in the box below.

1. Use a marking gauge to scratch a ~~per~~ straight line parallel to the sides down the middle 6mm in. ~~of the wood~~. Then use a steel rule to mark out 12mm in from the ends with a pencil. Then use a try square to draw a straight line at the 12mm mark. And where the lines cross is where the hole should be.



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1. (b) (continued)			
The dowel holes in side A were drilled to a depth of 15mm.			
(ii)	Outline how to ensure the holes were drilled to this depth.	1	
	<u>Set the depth stop on the drill to 15mm.</u> <u>And make sure that it is 15mm from</u> <u>touching the wood otherwise the hole</u> <u>will be too shallow.</u>		
(iii)	Name an alternative joint that could be used to join the sides of the sound box.	1	
	<u>Dove tail.</u>		
(c) Pieces of softwood were joined together to make the sound box top.			
			
(i)	Name a suitable adhesive to join the pieces of softwood together.	1	
	<u>Wood glue. Epoxy resin.</u>		
(ii)	Outline a suitable method of holding the pieces of softwood together until the adhesive sets.	1	
	<u>F-clamps.</u>		

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1. (c) (continued)	
Varnish was brushed on to the sound box top.	
(iii) Describe how to achieve a high quality brushed finish.	2
Don't overload the brush.	
Sand it down between layers.	
layer it up.	

1. (continued)

(d) The cable tidies were made from acrylic.



(i) Name an appropriate saw that could be used to cut out the cable tidies.

1

Scroll Saw,

(ii) Describe the stages used to obtain a good finish on the edges of the acrylic after sawing, with reference to workshop tools/equipment.

3

Drawsile it using a file.

Sand it down using sandpaper.

Clean it off with steel wool.

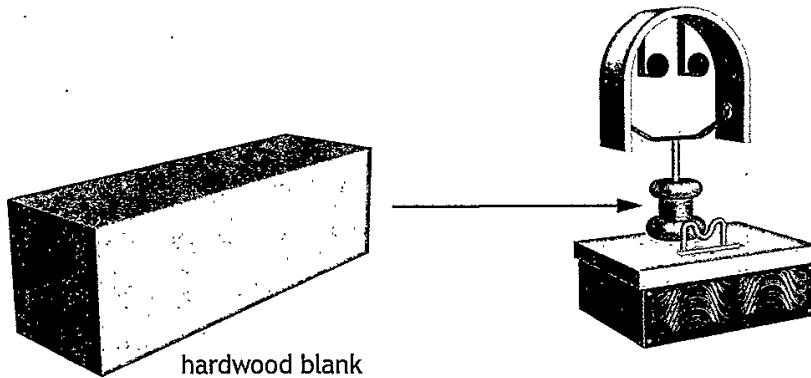
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1. (continued)

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(e) The earphone holder was turned from a hardwood blank.



(i) Name a suitable hardwood for the earphone holder.

1

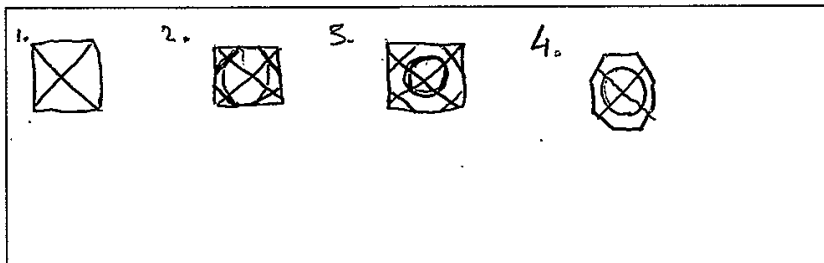
~~Mahogany~~ Mahogany.

(ii) Describe four stages in preparing the hardwood blank before fitting it on the woodturning lathe, with reference to workshop tools.

4

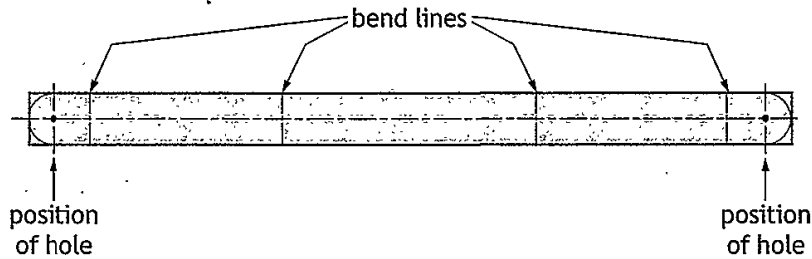
Sketches may be used to illustrate your answer in the box below.

2. Use a steel rule and a pencil to mark out a ~~hex~~ octagonal shape on the ends of it.
1. Mark out ~~a~~ two lines from the diagonals to mark the centres.
3. Mark out with a compass and pencil the diameter ~~oss~~ the earphone holder.
4. Cut the ~~octagonal~~ block with a tenon saw the octagonal shape, while secured in ~~the~~ a bench vice.



1. (continued)

(g) The stand support was made from mild steel and marked out as shown below.

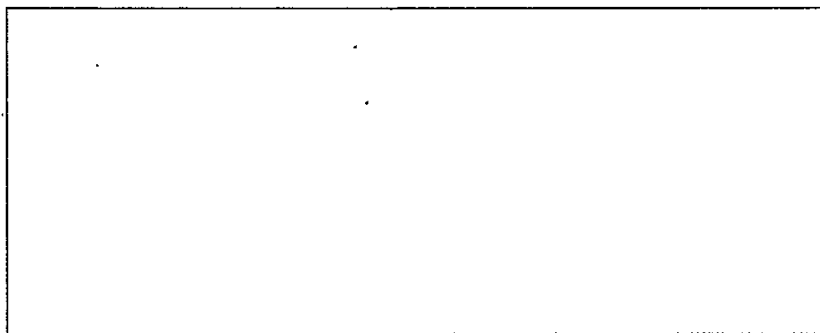


(i) Describe how to measure and mark out the stand support, with reference to workshop tools.

3

Sketches may be used to illustrate your answer in the box below.

1. Use odd leg callipers to mark out the line down the middle.
2. Use a steel rule and a scriber to scratch in the bend lines and to cross section for the holes.
3. Then ~~use~~ use a punch and hammer to mark out the holes.



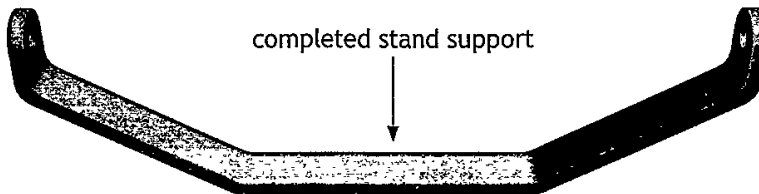
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1. (g) (continued)

The stand support was bent to shape and finished as shown below.



- (ii) Describe how to form the bends on the stand support, with reference to workshop tools.

2

Use a metal former that is clamped to the bench to ^{C-clamp} ~~clamp~~ your metal on and then using a hammer whack it as close to the bend as possible round the former.

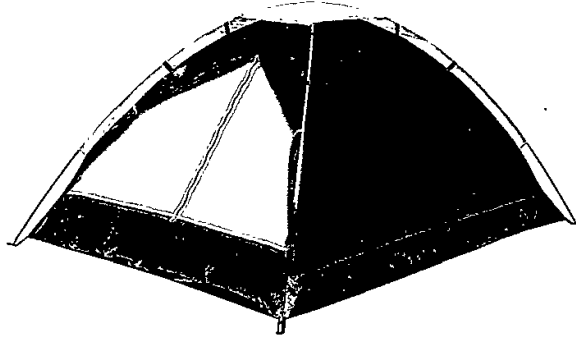
The mild steel stand support was dip coated in plastic.

- (iii) Explain why the stand support was dip coated.

2

Dip coating leaves a even finish and ensures all of the product is covered. ~~It~~ prevents corrosion.

2. A camping tent is shown below.



Designers use research techniques such as user trips and questionnaires to gather information.

- (a) Outline two pieces of information that could be gathered from a user trip on the camping tent. 2

~~How waterproof the tent is.~~

How durable it is.

How easy it is to set-up and take down.

- (b) Describe the key stages of carrying out a questionnaire. 3

~~1~~ Make at least 5 questions.

Try to avoid open ended ones.

Send it out to as many people as possible.

Analyse and display the results.

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3. A designer often uses idea generation techniques.

Describe the key stages of an idea generation technique with which you are familiar.

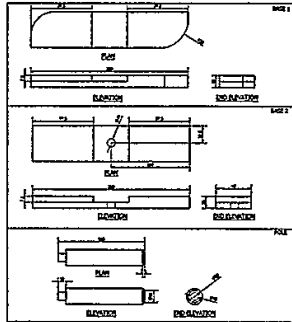
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You may use sketches to illustrate your answer in the box below.

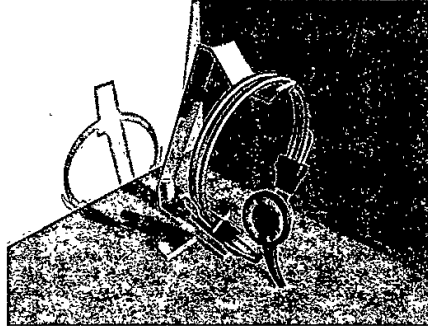
Brain storming is when you get in a group and try to think of any ideas and write them down and then you try can try to get inspiration from other peoples ideas and at the end you should have a range of ideas to choose and expand from.

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4. The two graphic techniques shown below were used during the design of a headphone stand.



working drawing



computer-generated graphic

Outline the reasons for using the following graphic techniques in the design process:

- (a) working drawing _____ 2

clearly displays the components.
Accurately and clearly displays sizes.
Which makes it easier for the manufacturer
to understand.

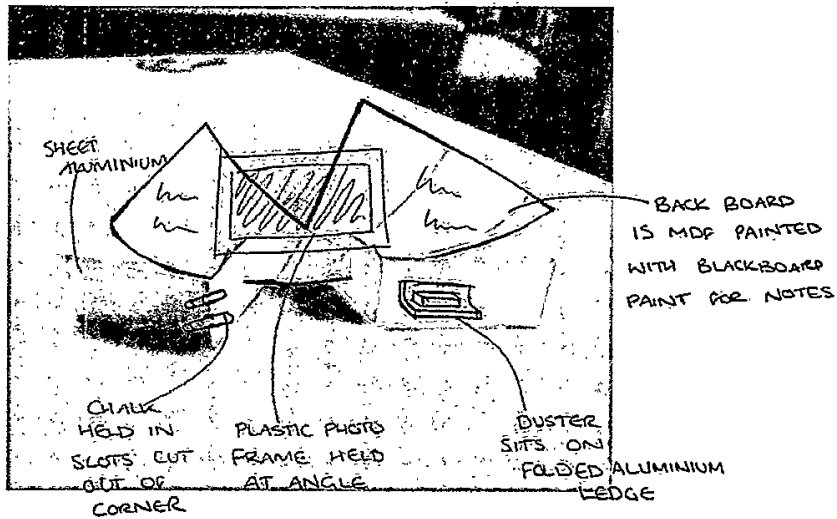
- (b) computer-generated graphic _____ 2

Saves on materials.
Easy to share with people.
Easy to make amendments.

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5. Designers often use sketch models as shown below.



Describe two benefits to designers of using sketch models.

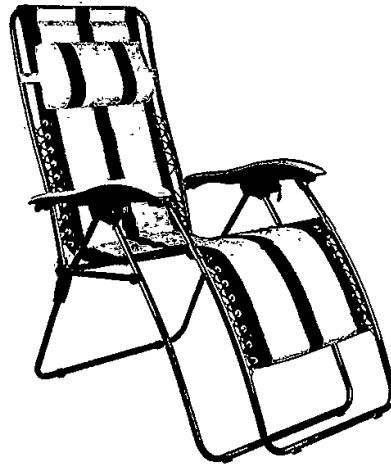
2

They are quick to make.

They give you a clear image of what it looks like without using lots of materials.

[Turn over

6. A sun lounger is shown below.



You must give different examples in (a) and (b).

(a) Describe how ergonomics may have influenced the design of the sun lounger.

4

~~How easy it is to fold in and out.~~
 How long the cushion should be.
 How wide the seat should be.
~~How easy it is to get on and off.~~
 The seat would need to fit the 5th-
 95th percentiles.
 How long the arm rests are.
 How long ~~the~~ high the arm rests are.
 How adjustable it is.
 How wide the arm rest should be.
 How heavy it is to move around.

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6. (continued)			
(b) Describe how function may have influenced the design of the sun lounger.	2		
<i>How easy it is to get on and off.</i>			
<i>How easy it is to be sold in and out.</i>			
<hr/> <hr/> <hr/> <hr/>			
(c) Describe how the life expectancy of the sun lounger could be extended by the designer.	2		
<i>Made from hard wearing materials.</i>			
<i>Make it easy for the consumer to repair.</i>			
<hr/> <hr/> <hr/> <hr/>			
[Turn over			

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7.	The design of products may evolve as a result of technology push or market pull.		
(a)	Describe what is meant by technology push.	1	
	<p>A technology push is when consumers want a certain thing is invented & so business will try to be the first to sell it commercially and successfully.</p>		
(b)	Describe what is meant by market pull.	1	
	<p>This when consumers are looking for a product so more businesses try to get into that market of that product.</p>		
	New products can be difficult to launch in a competitive market.		
(c)	Outline two marketing techniques that could be used to promote new products.	2	
	<p>Adverts on billboards and TV. Celebrity endorsement.</p> <hr/> <hr/> <hr/> <hr/>		

8. A child's pedal car is shown below.



Describe the aesthetic aspects of the child's pedal car.

4

Looking from the front it would be very symmetrical.

The yellow and black contrast well with each other and the silver of the wheels and bumper.

The car body looks smooth in texture. It has a sticker on the side to add to the 'race car' theme.

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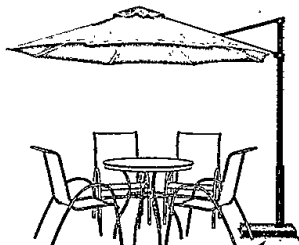
SECTION 2 — 20 marks

Attempt ALL questions

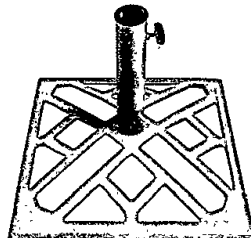
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9. The parasol bases shown below have been produced using a range of materials and processes.

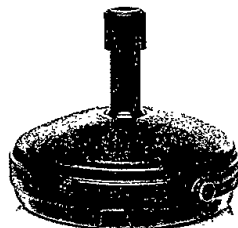


parasol base



metal base

- Metals**
- copper
 - cast iron
 - aluminium.



plastic base
(filled with water)

- Plastics**
- acrylic
 - polypropylene
 - urea formaldehyde.

(a) Select the most appropriate material for each base from the lists provided and state why they would be suitable.

A different property must be given for each item.

(i) Metal base Cast iron 1

Suitable because It's heavy and can support the weight of the umbrella. 1

(ii) Plastic base Polypropylene 1

Suitable because It can be ~~used for~~ ^{used for} ~~rotational~~ ~~making~~ making it useful for mass production. 1

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9. (continued)

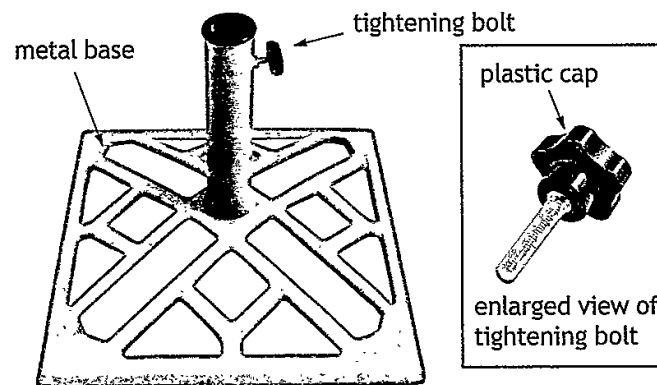
Rotational moulding was used to manufacture the plastic base.

- (b) State two identifying features of rotational moulding.

2

Intricate detail
line where the two halves of the ^{mould} join.

- (c) The metal base is shown below.

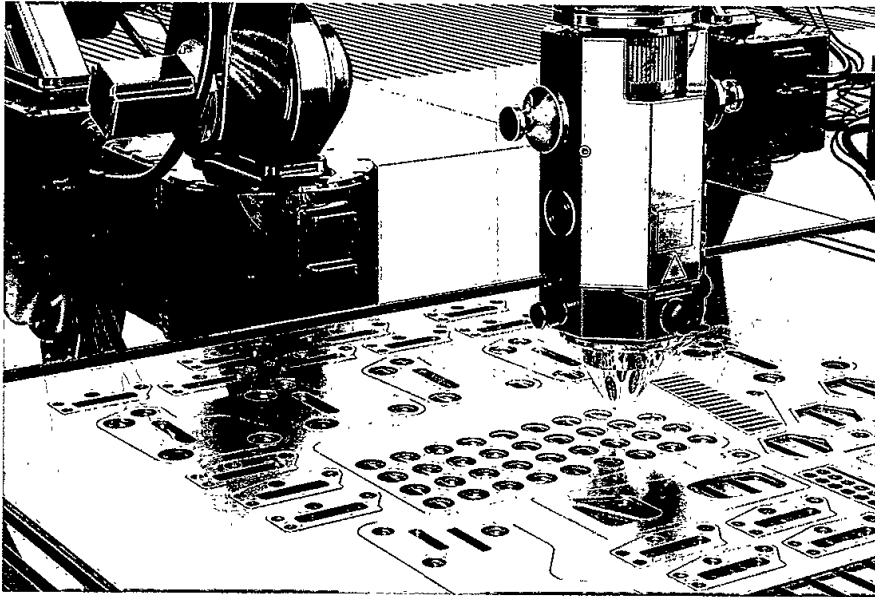


Name a process that could have been used to manufacture each of the following parts:

- (i) metal base die casting. 1
- (ii) plastic cap ~~injection moulding.~~ Injection moulding.

[Turn over

10. Laser cutters are widely used in the manufacture of products.



- (a) Describe the impact that the use of technologies such as laser cutting have had on the manufacture of products.

4

They are more accurate.

They are all exactly the same.

They are quicker than traditional methods.

They are cheaper to run than employ workers.

They allow a lot more are able to keep up with demand better.

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10. (continued)		
Changes to society have occurred due to modern manufacturing technologies.		
(b) Describe how manufacturing technologies have impacted society.	2	
<u>Deskilled workforce.</u>		
<u>Made a lot of products cheaper.</u>		

[Turn over		

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11. Furniture can be manufactured using one-off production methods.



(a) Explain two benefits of one-off production.

2

*Finished to a better quality.
Could be longer lasting than cheaper
mass produced products.*

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11. (continued)

Designers have a responsibility to ensure that the materials used in products have minimal negative impact on the environment.

- (b) Describe how the environmental impact of the materials used in products could be minimised.

4

Make components recyclable.
Use standard components to make them more fixable.
Source materials locally is possible.
Use recycled materials.
Buy wood from sustainable forests.

[END OF QUESTION PAPER]