Candidate 3

SECTION 1 — 60 marks

Attempt ALL questions

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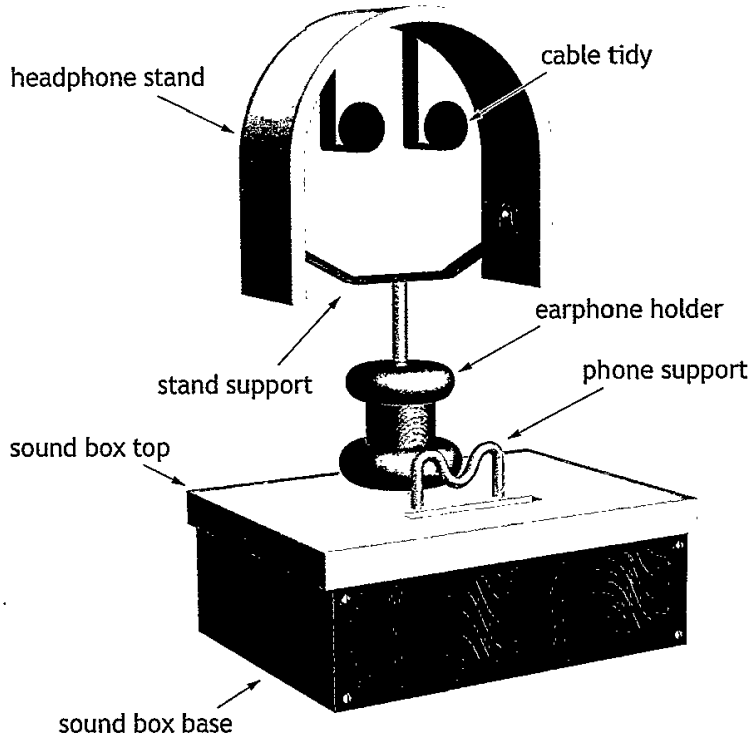
1. A design proposal for a sound box with a phone and accessory holder is shown below.



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

(i) Name a suitable softwood for the sound box top. 1

Red Pine

The sound box base was made from MDF.

(ii) State a benefit of using MDF rather than softwood. 1

It is much easier to get a large board of MDF than Softwood.

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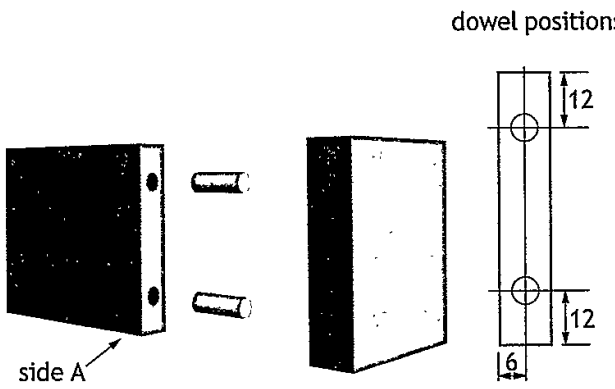
1. **(continued)**

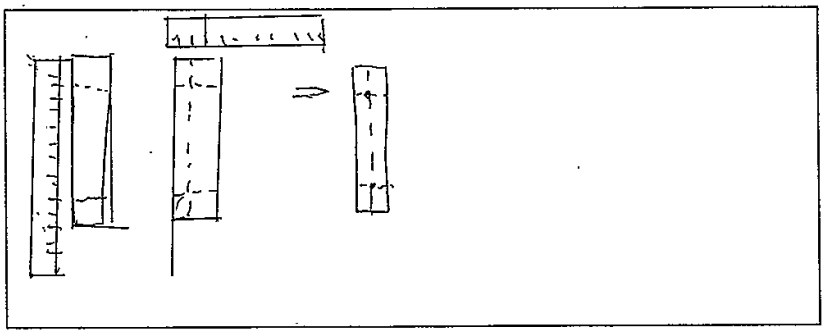
(b) Dowel joints were used to join the sides of the sound box together.



(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.

Using a Steel rule you can measure the areas for the dowels by the lengh and bridth With a pencil and using a marking gauge you can make a mark in the Centre



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1. (b) (continued)

The dowel holes in side A were drilled to a depth of 15mm.

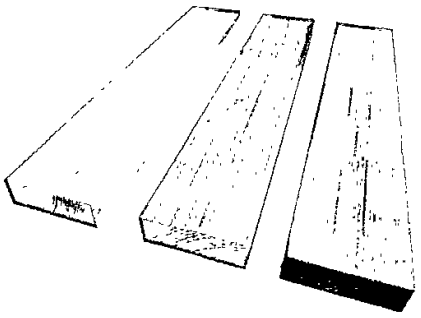
(ii) Outline how to ensure the holes were drilled to this depth. 1

Using a Steal rule measure out 15 mm upon from the ~~surface~~ drill using tape So when drilling you see stop when the tape reaches the wood

(iii) Name an alternative joint that could be used to join the sides of the sound box. 1

finger joints

(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

Glue

(ii) Outline a suitable method of holding the pieces of softwood together until the adhesive sets. 1

Using a clamp to hold the pcies s of wood together while the adhesive sets

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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

Sanding down the surface before varnishing leaving a smoother finish, making sure there is no bristles or dust in the setting varnish

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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

Copping 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

c
n

Wet and dry Polish

Use a file to create a even ~~smooth~~ edge. then using the wet and dry to create a smoother edge then polish using a towel

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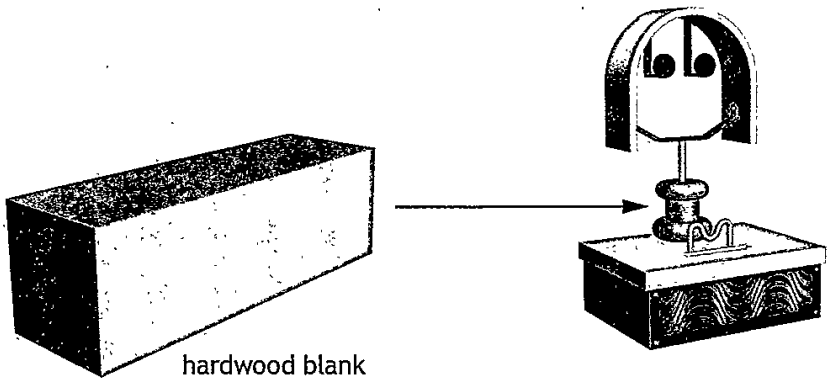
1. (continued)

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



hardwood blank

(i) Name a suitable hardwood for the earphone holder. 1

Oak , 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.

Use a Plane to Create an almost Circle and Steal rule Using a Compass measure the Size for your Circle then Using a Steal rule find the Centre of your wood then Using a Compass Mark out your Circle, Using a Plane Plane the wood until it is an almost Circle almost reading the circle

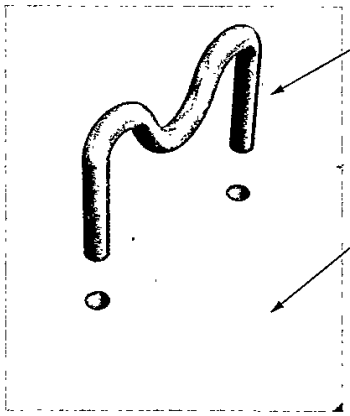
MARKS | DO NOT WRITE IN THIS MARGIN

1. (e) (continued)

(iii) Outline **two** ways of ensuring a high quality finish on the earphone holder when using the wood lathe. 2

Using Sand paper while the is turning creating a smoother finish

(f) The phone support was made from copper and joined to the sound box top using epoxy resin.



Outline **two** reasons why epoxy resin is a suitable adhesive. 2

It joins both wood and copper

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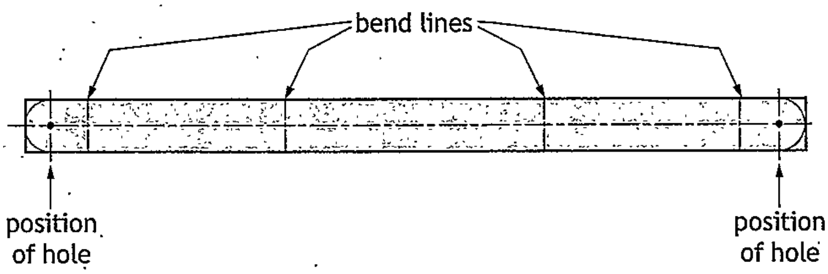
1. (continued)

(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.

~~Using a ~~ Calliper~~

Using a steel rule the measure the position of the hole and bend lines, and using an engineer try square the mark the

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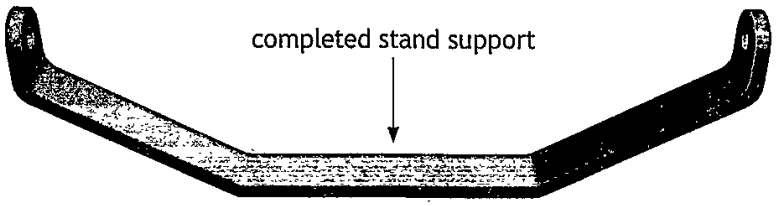
1. (g) (continued)

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

Using the bench clamp to hold the metal, the using the mallet you and an object for the metal to bend around it can create the bends

The mild steel stand support was dip coated in plastic.

(iii) Explain why the stand support was dip coated. 2

it can allow the metal to have a longer life span Slowing down erosion as mild steel is an ferrous metal

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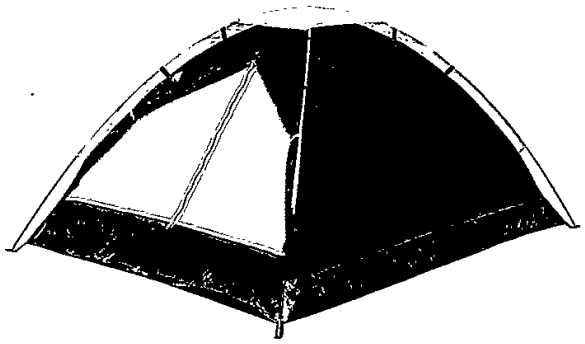
2. A camping tent is shown below.



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

durabily of the tent
Whether the tent was easily put up
Wether if it was or wasn't
fit for purpose

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

deciding the questions
if the question s are aimed at
the target maket

anayls data from questionaire

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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. 3

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

Brain Storming
deciding the aim of the activity
being withing a group of people
throwing in ideas
deciding the final idea
whether everyone agrees or not

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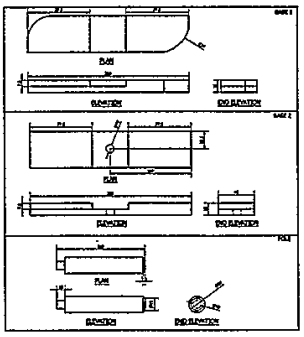
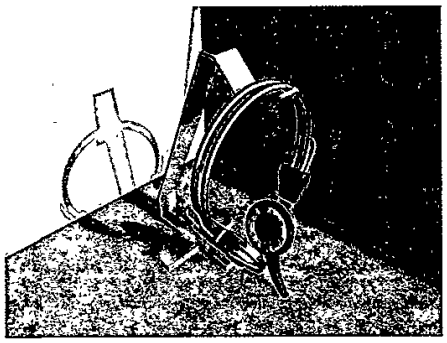
4. The two graphic techniques shown below were used during the design of a headphone stand.



working drawing



computer-generated graphic

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

(a) working drawing 2

looking at the exact measurements, finding every piece within the model

(b) computer-generated graphic 2

you can see the model from every angle and can make easier changes to anything on the model than it

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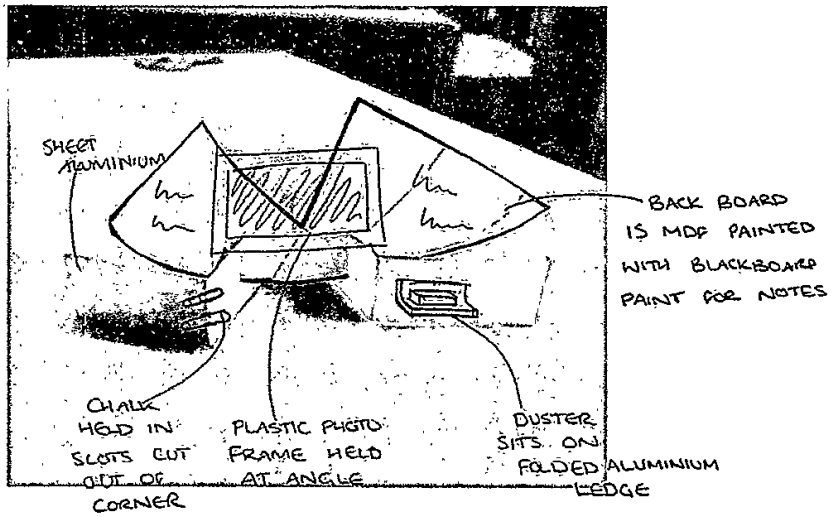
5. Designers often use sketch models as shown below.



Describe **two** benefits to designers of using sketch models. **2**

You can get a visual of your product and make changes or advice

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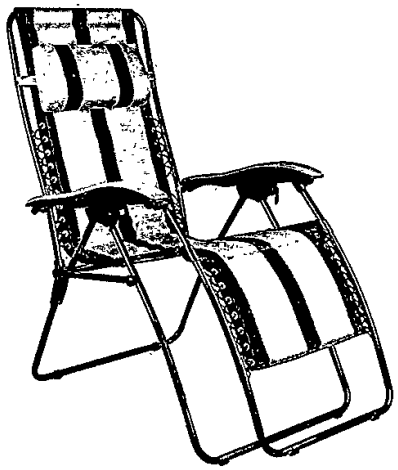
6. A sun lounger is shown below.



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

(a) Describe how ergonomics may have influenced the design of the sun lounger. 4

ergonomics could have influenced the height of the back part of the chair using anthropolics getting an average of Peoples back sizes ~~or~~, the colour of the chair could be used to attract the target market, ~~that that test~~

MARKS | DO NOT WRITE IN THIS MARGIN

6. (continued)

(b) Describe how function may have influenced the design of the sun lounger. 2

the function could have influenced the materials chosen, like making it a more durable material to last longer not

(c) Describe how the life expectancy of the sun lounger could be extended by the designer. 2

by adding a protective layer on the metal or plastic could make it last longer or having the materials be water proof.

[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**

the technology push is the new tech pushing our products to become better

(b) Describe what is meant by market pull. **1**

A Market pull is having what the Market wants.

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**

Selling under a brand or edibrik, creating adverts on the Tv or news paper

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

Describe the aesthetic aspects of the child's pedal car. 4

it is a bright yellow colour which attracts children, it is a smooth shape making it look better, it is a racing car or taxi thus suiting the target market of children

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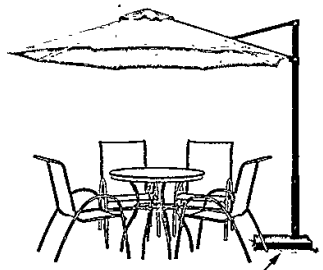
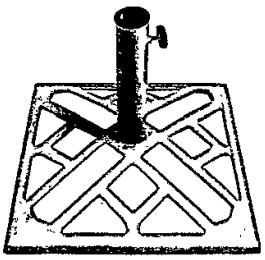
SECTION 2 — 20 marks

Attempt ALL questions

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 aluminion 1

Suitable because it is a non-ferrous metal meaning it won't erode over time 1

(ii) Plastic base Polypropylene 1

Suitable because it is water proof meaning it won't lose shape due to the large amount of water. 1

MARKS | DO NOT WRITE IN THIS MARGIN

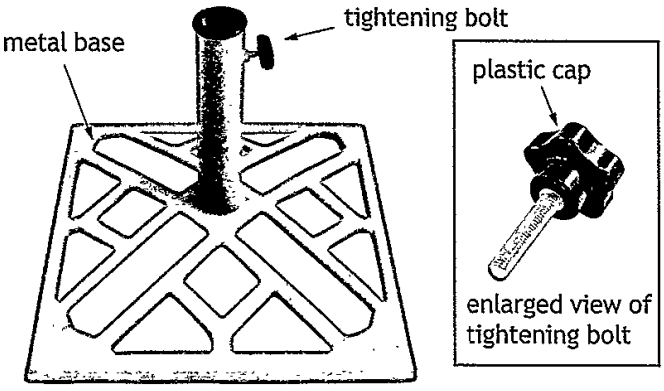
9. (continued)

Rotational moulding was used to manufacture the plastic base.

(b) State **two** identifying features of rotational moulding. **2**

the ejection lines, grainy surface

(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 Sand Casting **1**

(ii) plastic cap Injection Molding **1**

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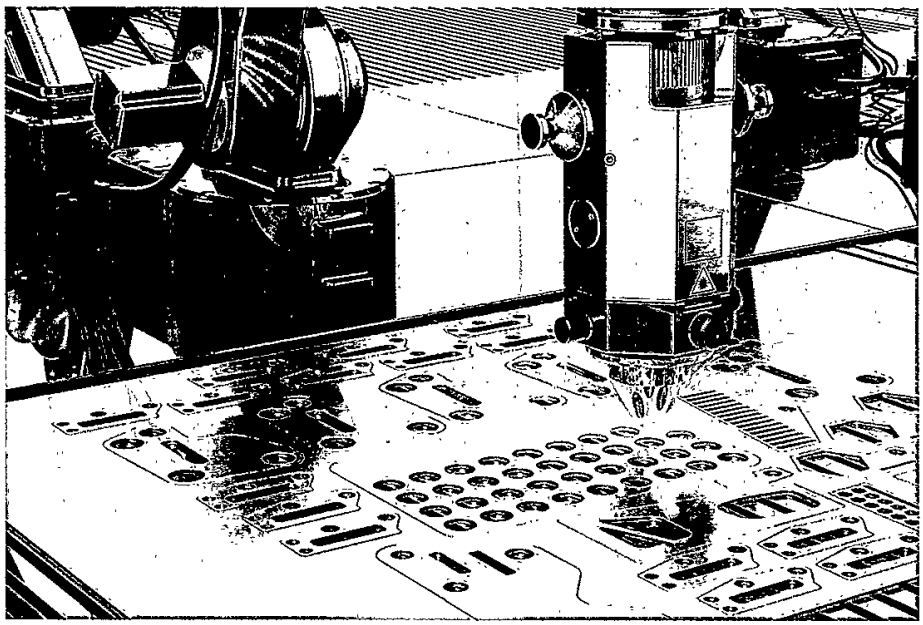
10. Laser cutters are widely used in the manufacture of products.



(a) Describe the impact that the use of technologies such as laser cutting have had on the manufacture of products. 4

~~less need of a labour work force,~~ ~~lower wages,~~ it is much more exact meaning products are all the same, products are sent out much faster as the technology is much faster, products can get much more intricate as machinary ~~is much more~~ don't have human limits

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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**

their is a loss of a need for a labour work force, lowering wages and adding to the people without jobs.

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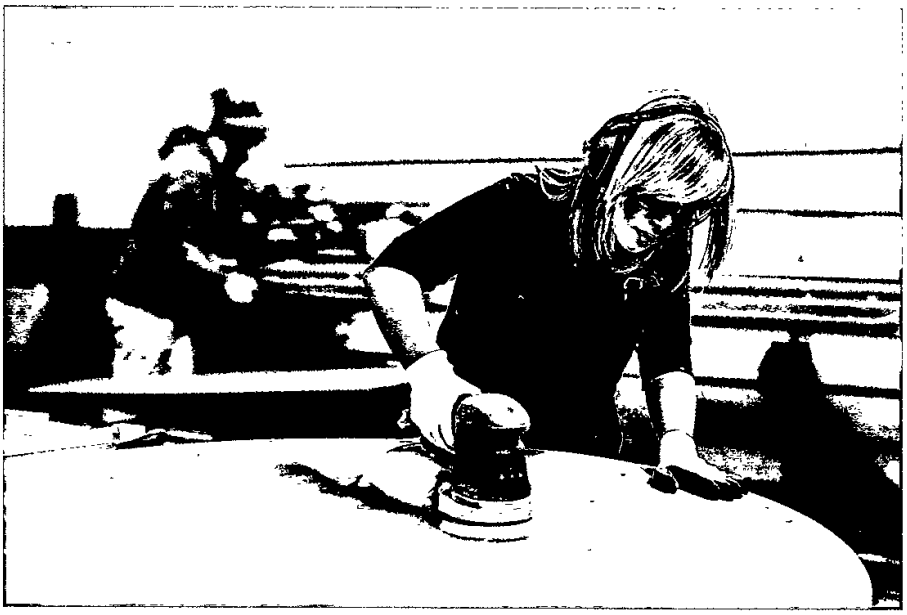
11. Furniture can be manufactured using one-off production methods.



(a) Explain two benefits of one-off production. **2**

it is more unique, their isn't a need to make it suitable for mass production, you can do things not possible for machinery

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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

Using protective coats with give materials a longer last meaning we do not need to keep buying and throwing away materials, using sustainable and environmentally friendly materials, adding labels of what can and cant be recycled to things like water bottles and boxes

[END OF QUESTION PAPER]