Candidate 2

SECTION 1 — 60 marks
Attempt ALL questions

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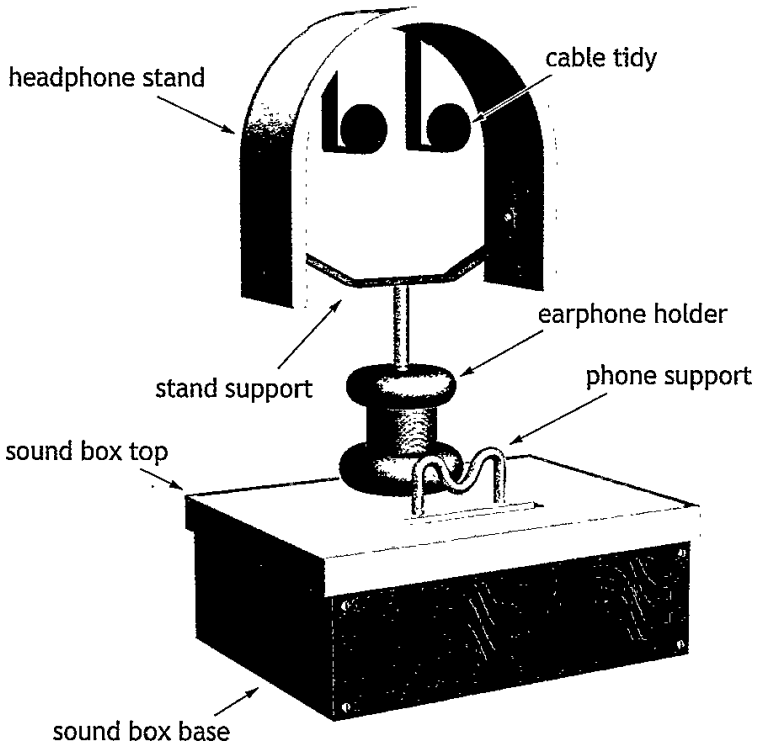
1. A design proposal for a sound box with a phone and accessory holder is shown below.



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

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

Pine

The sound box base was made from MDF.

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

It is stronger than ~~MDF~~ softwoods

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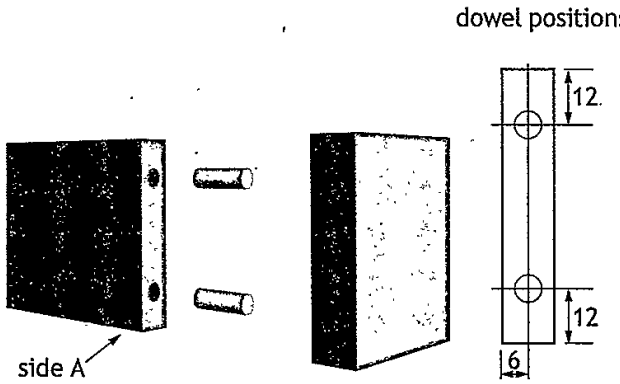
1. (continued)

(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, go down 12mm from the top and 12mm from the bottom. Then go in 6mm from the side of the chosen side and mark a cross where both points have been made

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1. (b) (continued)

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

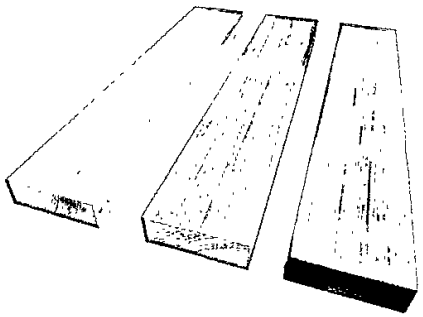
(ii) Outline how to ensure the holes were drilled to this depth. 1

Mark on a side by going 15mm down and then drill until you reach that point

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

corner rebate

(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

epoxy resin

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

use sash clamps to ensure they are tightly together

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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

sand with all grains of sandpaper before varnishing, then varnish with light coats then sand again, keep doing this until satisfied

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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

coping 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

- cross file all sides to make smooth
- draw file all sides to make smooth
- use wet and dry paper
- use emery cloth

[Turn over

1. **(continued)**

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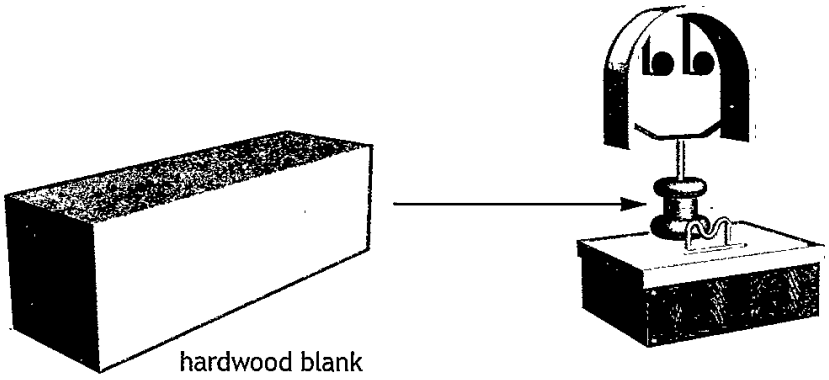
(e) The earphone holder was turned from a hardwood blank.



hardwood blank

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

oak

(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.

- ensure lathe is set to right distance
- ~~safety goggles must be worn~~
- sand hardwood blank
- make sure safety gaurd is down on the lathe
- make sure the wood is the correct size

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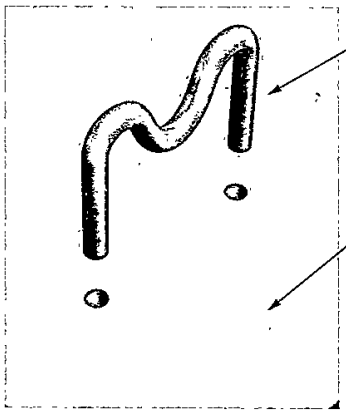
1. (e) (continued)

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

take away wood slowly when using centre lathe

make wood wet before use

(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

easy to obtain

very strong once dry

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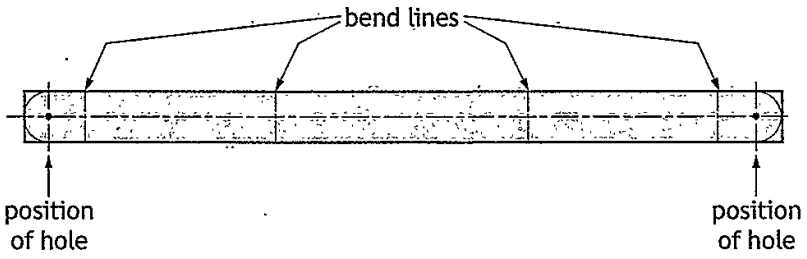
1. (continued)

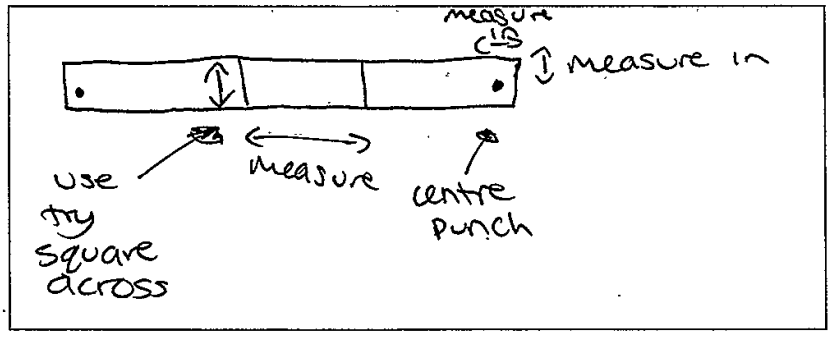
(g) The stand support was made from mild steel and marked out as shown below.



(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 steel rule, mark the first two bend lines the size wanted then use a steel rule to put across the whole side. do this with the next 2 bend lines also. Then come in wanted size from top/bottom then use centre punch to get rough idea of holes



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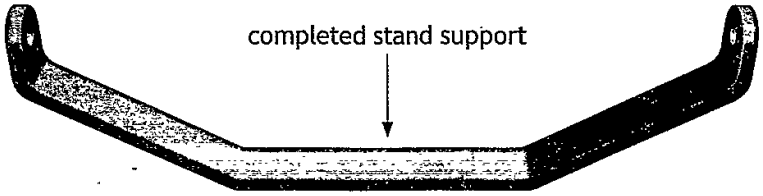
1. (g) (continued)

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

with the lines drawn where the bends are using steel rule and pencil, use the box folder to bend all necesary ~~for~~ pencil lines

The mild steel stand support was dip coated in plastic.

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

- it is a very easy way to colour metal
- so there are no drip marks from paint etc.

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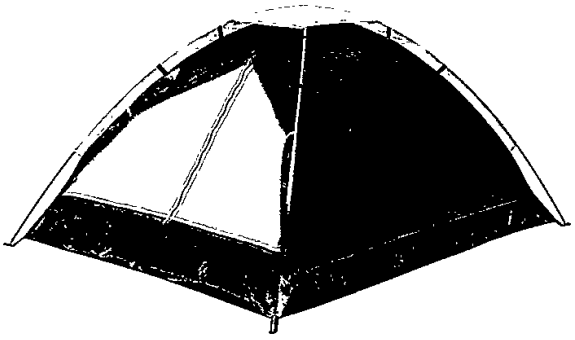
2. A camping tent is shown below.



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

- why the user liked/didn't like the product
- did the product work as it should

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

- gather people for questioning
- ask questions
- gather feedback on the questions

MARKS | DO NOT WRITE IN THIS MARGIN

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.

a good idea generation technique is a survey. This is where you come up with as many ideas as possible and gather a group of people to vote on the best idea and whatever has the most votes gets chosen as the idea

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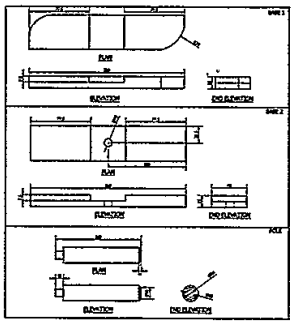
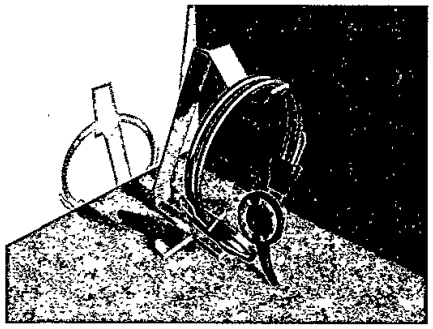
4. The two graphic techniques shown below were used during the design of a headphone stand.



working drawing



computer-generated graphic

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

(a) working drawing to see ~~[illegible]~~ parts are the correct size to see if all the parts fit together well — 2

(b) computer-generated graphic to see what the product will look like to see if all the parts fit together well — 2

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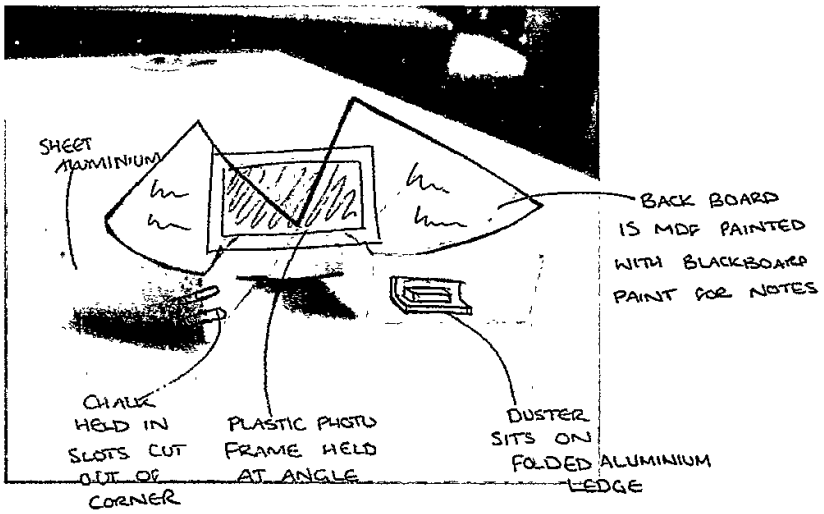
5. Designers often use sketch models as shown below.



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

- it is quick to make
- it makes you come up with new ideas

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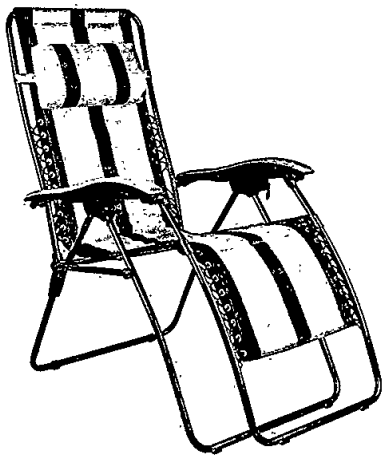
6. A sun lounger is shown below.



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

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

- There is a pillow where the head will go so the person lying will be comfortable
- There are armrests to allow to person lying to be more comfortable
- the pillow is made to be easily adjustable to allow people of all height to ~~lay~~ lay here
- The lounger is orange so it does not get absorbed by the sun so the lounger is not very hot before sitting on it.

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6. (continued)

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

- The lounger should be made to withstand big weight as the fuction is that is to be sat on
- The ~~fuc~~ lounger can be moved back into a bed type ~~fuc~~ lounger as the function may also be to lay on it

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

- making the legs out of metal which doesn't rust
- making the chair water-resistant

[Turn over

MARKS | DO NOT WRITE IN THIS MARGIN

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

when technology gets more advanced

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

a lot of people start to like the product so price inflates

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

- posters
- billboards/adverts

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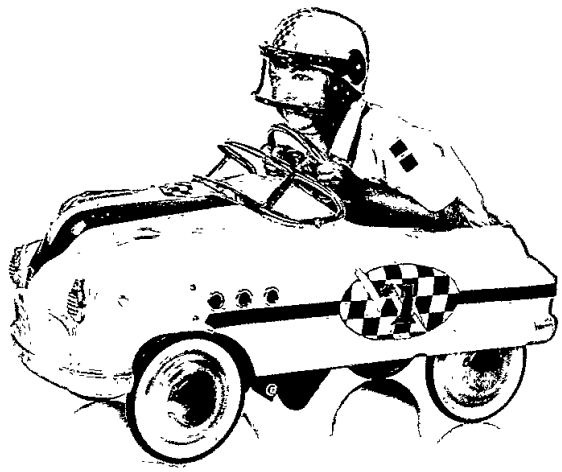
8. A child's pedal car is shown below.



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

- The pedal car has been made to look like a racing car so looks more appealing to children
- It is yellow which is a bright/happy colour which may appeal to children/adults
- It has been made yellow which can be liked by both boys and girls which is good for children.
- It has been made to fit a range of children

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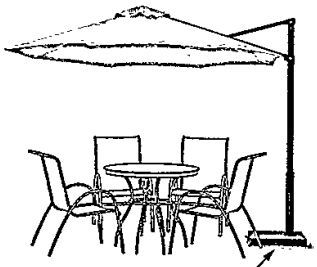
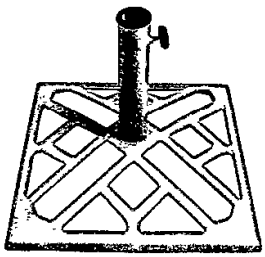
SECTION 2 — 20 marks

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 aluminium 1

Suitable because it doesn't rust so will always look good 1

(ii) Plastic base polypropylene 1

Suitable because it ~~[illegible]~~ is waterproof 1

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9. (continued)

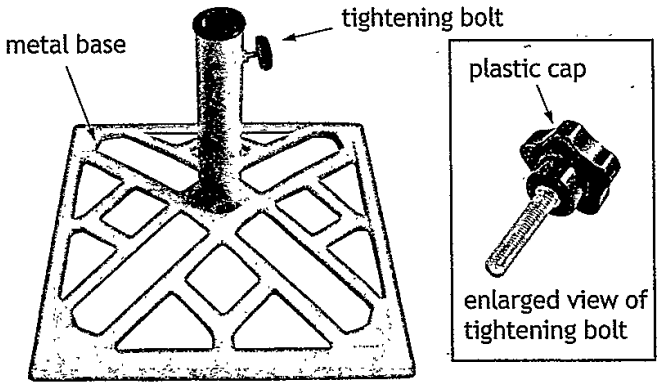
Rotational moulding was used to manufacture the plastic base.

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

split lines

injection marks

(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 Laser cutter 1

(ii) plastic cap vacuum forming 1

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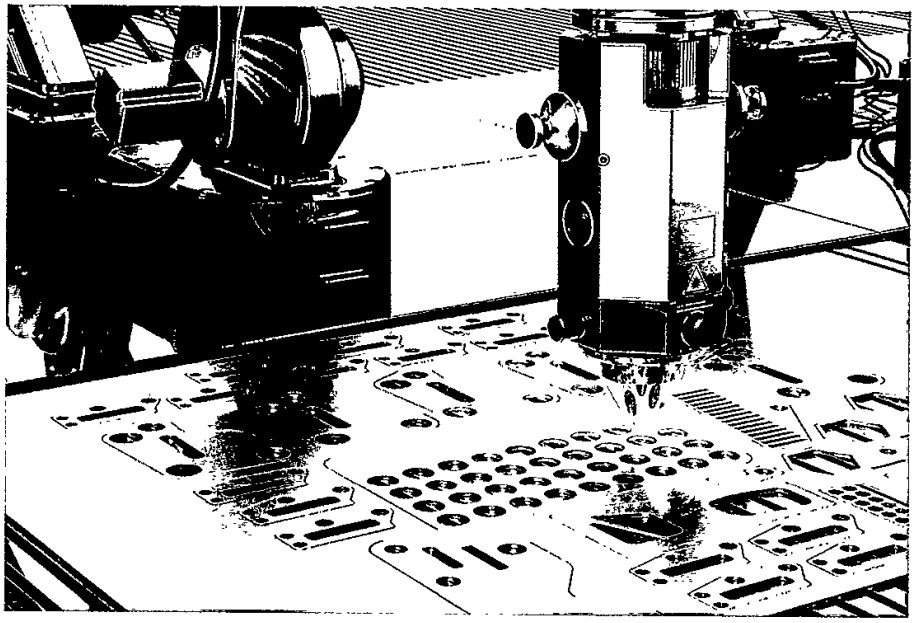
10. Laser cutters are widely used in the manufacture of products.



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

- it is now easier
- more expensive
- quicker
- more reliable

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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**

less people are working due to getting replaced by technology

people now rely more on technology

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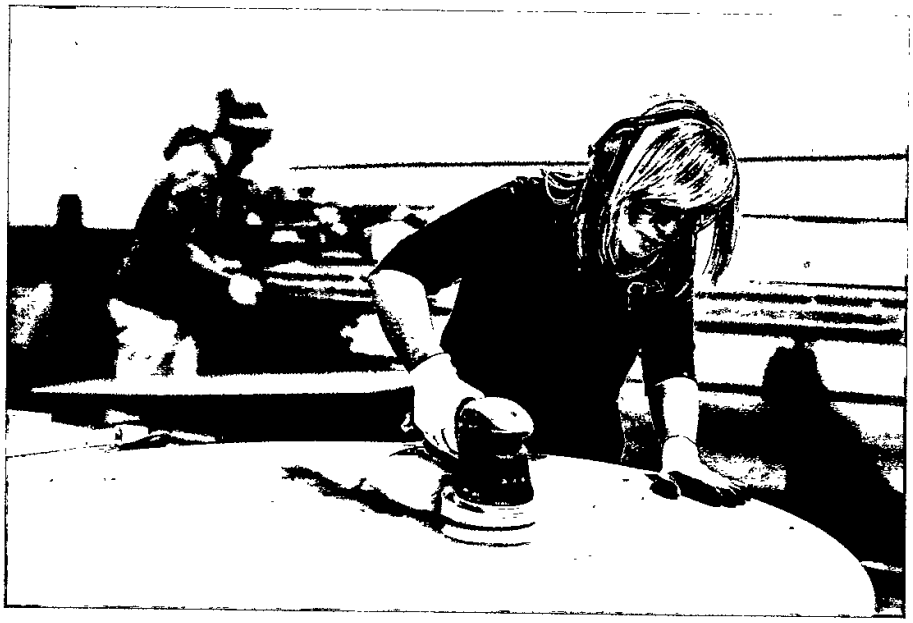
11. Furniture can be manufactured using one-off production methods.



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

- doesnt use much material because it is just "one off"
- it looks better because pronty is just on that one thing

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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

- use as little wood possible
- use recycleable material
- try and replace wood for metal
- re-use unused waste material

[END OF QUESTION PAPER]