Candidate 6

SECTION 1 — 60 marks

Attempt ALL questions

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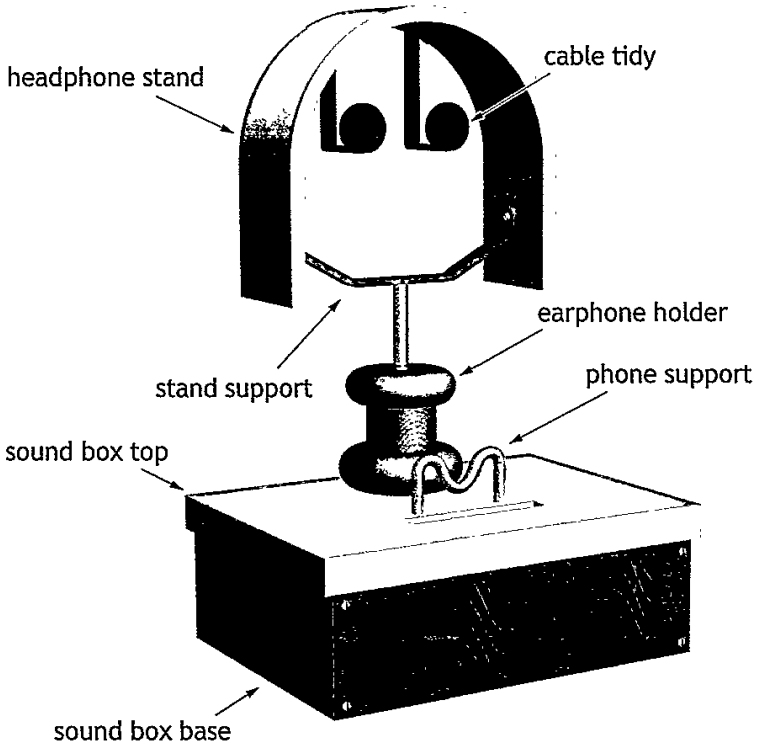
1. A design proposal for a sound box with a phone and accessory holder is shown below.



(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 comes in large sheets

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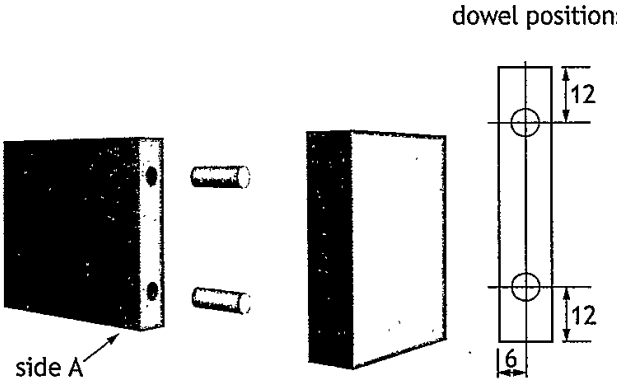
1. (continued)

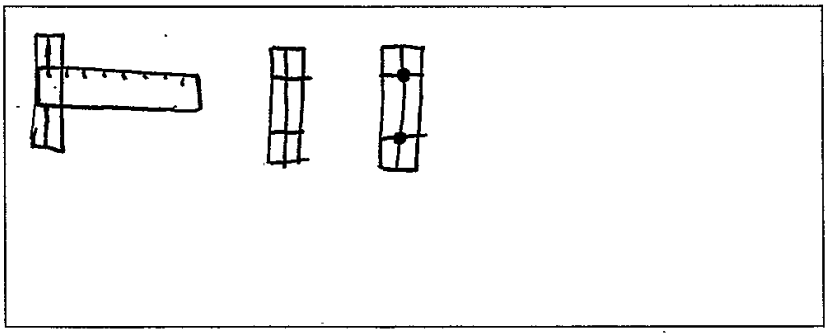
(b) Dowel joints were used to join the sides of the sound box together.



(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.

Use a steel rule and measure Side A's total width then half it and mark it on with a pencil, then draw lines across the material where you want it to be drilled and where the lines meet is where you drill.



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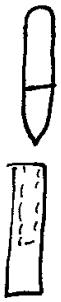
1. (b) (continued)

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

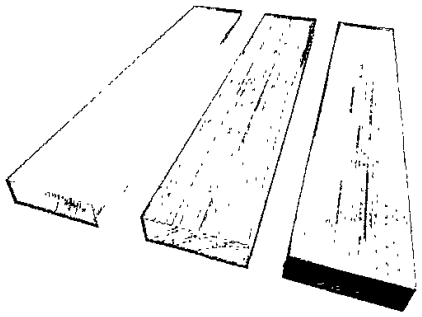


Mark 15mm on a pencil and put it in the hole you drilled and see if it matches up

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

Dovetail Joint

(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

Wood Glue

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

Sash Cramp

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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 roughest grade to softest grade sand paper and then apply multiple coats of 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

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

Put in vice and draw file it, cross file it and continue that pattern until it looks smooth then use wet and dry paper on it to achieve the best overall edge.

[Turn over

1. **(continued)**

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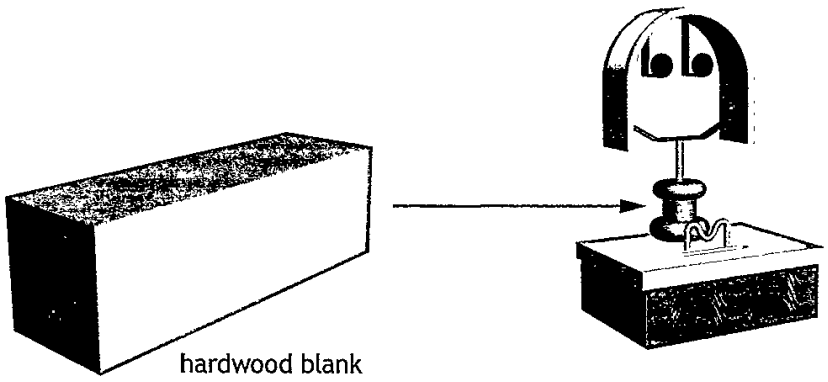
(e) The earphone holder was turned from a hardwood blank.



hardwood blank

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

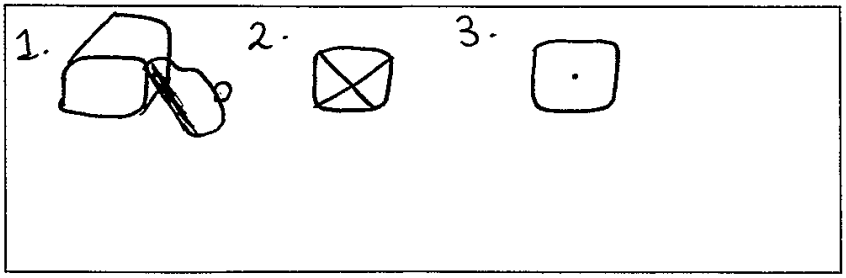
Oak

(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.

~~Plane off the~~

1. Plane off the corners
2. Saw 2 diagonal lines on one end
3. Find the centre of the other end and mark a small hole
4. Fit on to woodturning lathe



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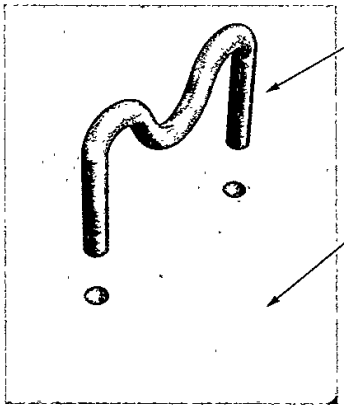
1. (e) (continued)

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

Increase spindle speed

Sand it while on ~~fast~~ lower speed so you don't get hurt

(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 dries quick and is clear~~

1. Its clear

2. Easy to work with

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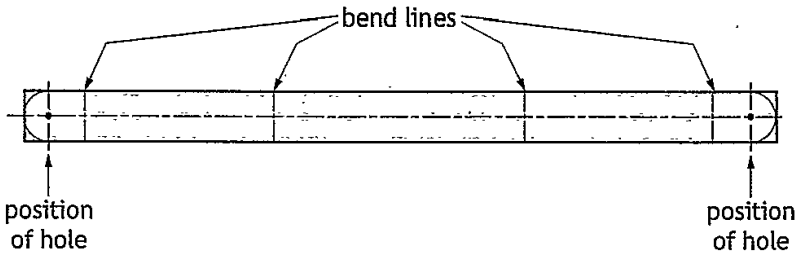
1. (continued)

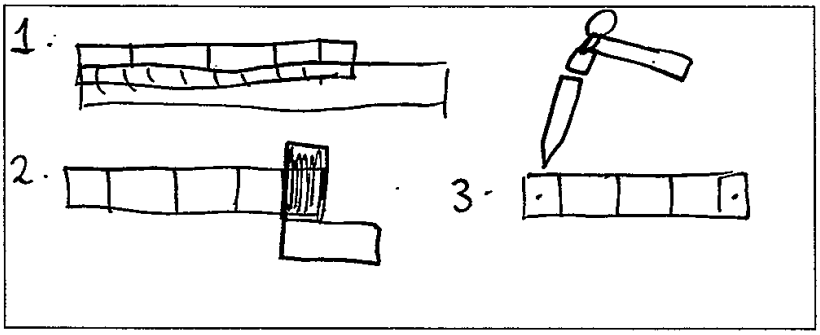
(g) The stand support was made from mild steel and marked out as shown below.



(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.

1. Use a steel rule to find how far along you want marked and draw a dot above it.
2. Use a try square and make the dot a line
3. Mark a hole where you want one with a hole punch and ball pien hammer



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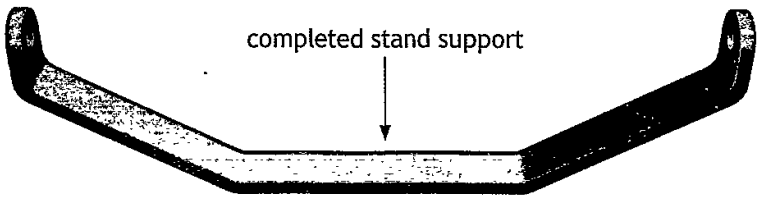
1. (g) (continued)

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

Put in vice and use a mallet to gently hit the material until it is the shape you want

The mild steel stand support was dip coated in plastic.

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

~~To make it stand~~

To make it more aesthetically pleasing and for extra protection.

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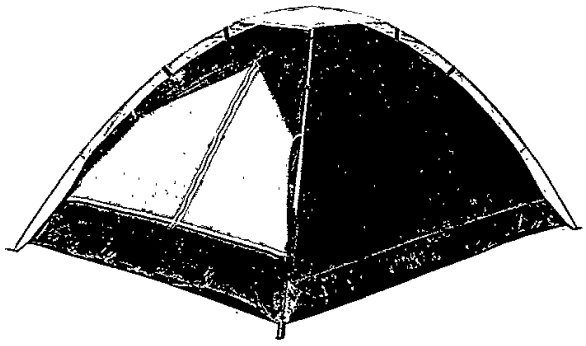
2. A camping tent is shown below.



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

If its waterproof and if it stays up and not fall down

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

1. Find things you are unsure on or would like further feedback on about your product
2. Design helpful questions ~~to~~ around your answers from Stage 1
3. Ask to Members of public
4. Analyse results and use feedback

MARKS | DO NOT WRITE IN THIS MARGIN

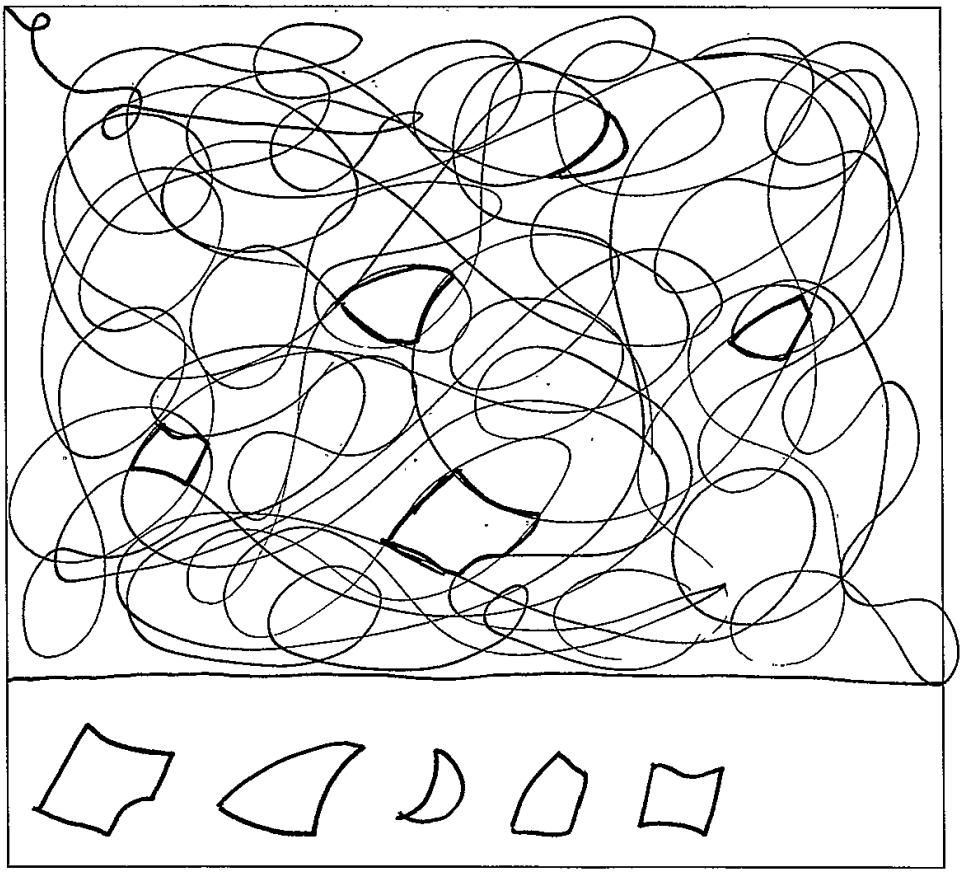
3. A designer often uses idea generation techniques.

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.

Take the pencil for a walk

- This is when you have a box and take a pencil and start from anywhere on the box and draw lines all around the box until its nearly full without taking your pencil off the paper. Then pick out unique shapes which can be used in a design.



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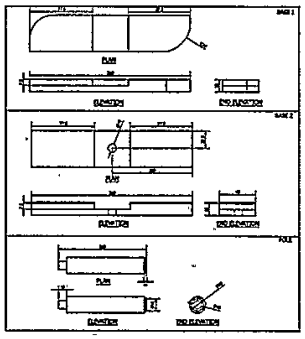
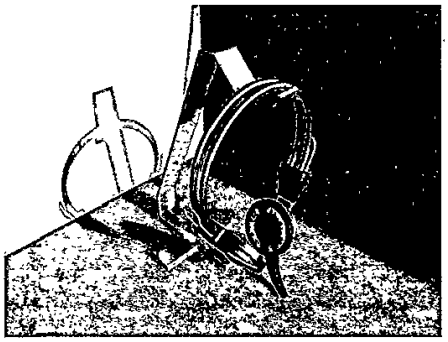
4. The two graphic techniques shown below were used during the design of a headphone stand.



working drawing



computer-generated graphic

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

(a) working drawing 2

Allows you to see your work from all angles and removes confusion on sizes etc

(b) computer-generated graphic 2

you see a preview of the real thing so you can remove confusion and ~~[illegible]~~ allows you to spot and change mistakes

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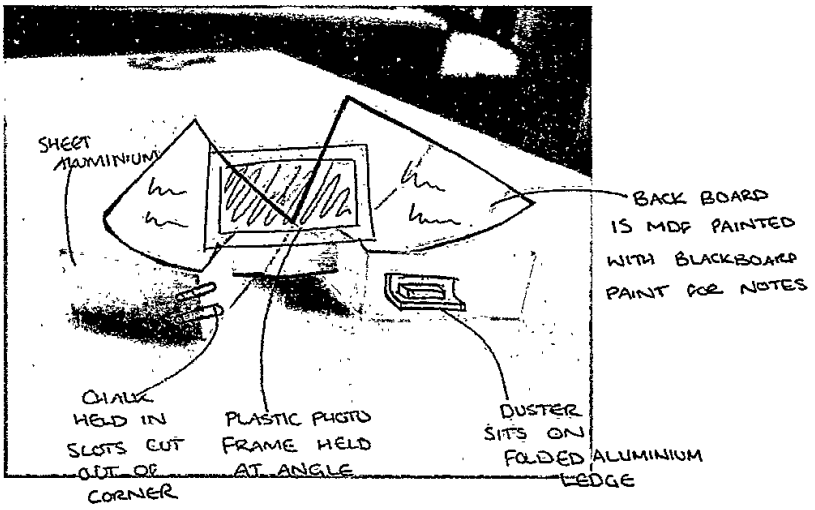
5. Designers often use sketch models as shown below.



Describe two benefits to designers of using sketch models. 2

1. Don't waste actual material

2. Allows to see a real sized representation of the model

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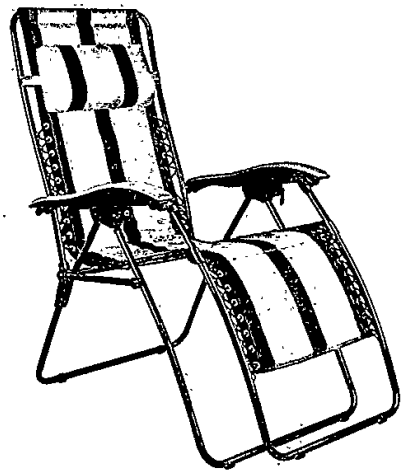
6. A sun lounger is shown below.



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

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

1. The colours make you think of warmth so you would sit in it in the sun
2. The length and width of arm rests
3. How high up the pillow is
4. The distance from the ground to the chair

MARKS | DO NOT WRITE IN THIS MARGIN

6. (continued)

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

1. If it can hold weight when sat on
2. If it easily reclines and goes back up

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

1. Make the material you sit on very strong
2. Make it fold over and come with a cover so its protected by rain

[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

New technology you didn't know you wanted until it was released

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

Technology designed based on the needs and wants of society

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

1. Included gift when purchase
2. Adverts during shows that are for the target market

MARKS | DO NOT WRITE IN THIS MARGIN

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

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

1. The bright colour
2. The chequered sticker
3. The yellow on the wheels
4. The black stripes on bonnet and side

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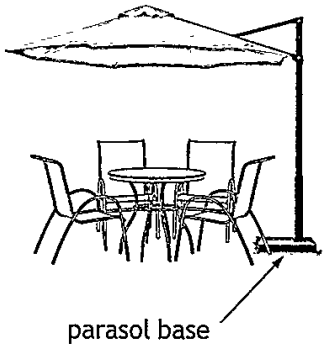
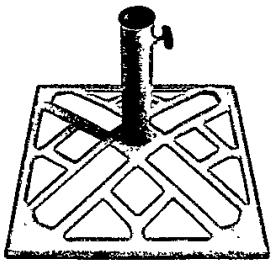
SECTION 2 — 20 marks
Attempt ALL questions

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 Non Ferrous 1

(ii) Plastic base Polypropylene 1

Suitable because Very strong hard plastic 1

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9. (continued)

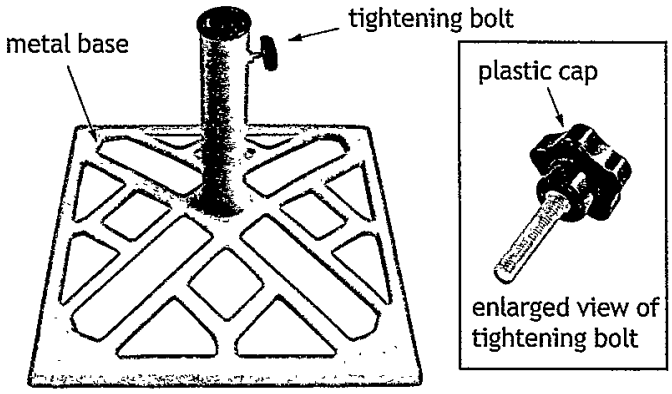
Rotational moulding was used to manufacture the plastic base.

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

1. Fold Lines

2. Webs

(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 1

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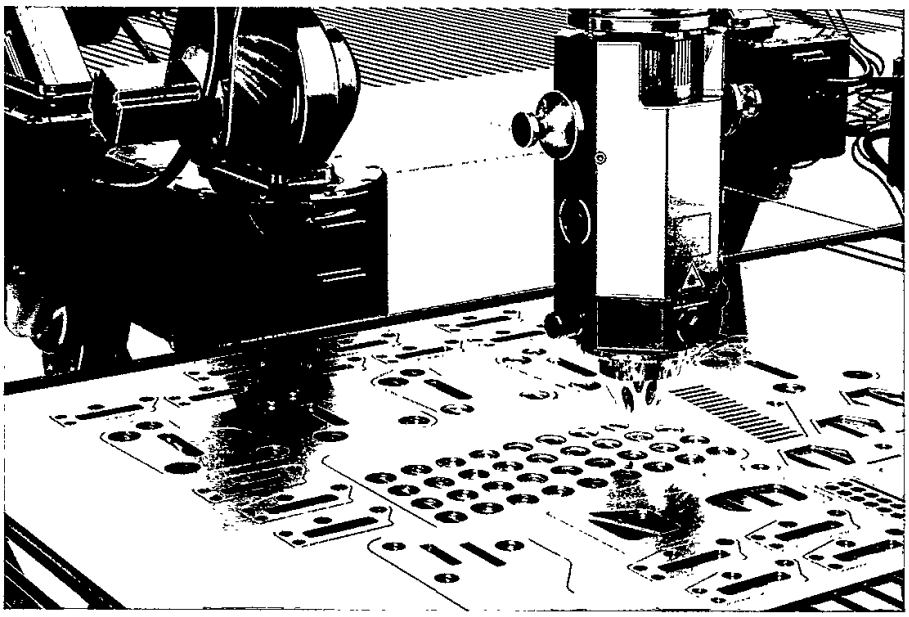
10. Laser cutters are widely used in the manufacture of products.



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

1. Faster and more efficient
2. Cleaner finish
3. Less done by hand
4. More dangerous

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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

1. Anyone in world can be sent product through email etc.
2. Can all be done cheaper and faster on a computer

[Turn over

MARKS | DO NOT WRITE IN THIS MARGIN

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

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

~~More effort is put in~~

1. Usually done with hand tools so looks nicer

2. More orignal

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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

1. Only use softwoods as softwood trees grow faster
2. Use recyclable material only
3. Use as little parts as possible
4. Offer money back if they give you the product back to be recycled.

[END OF QUESTION PAPER]