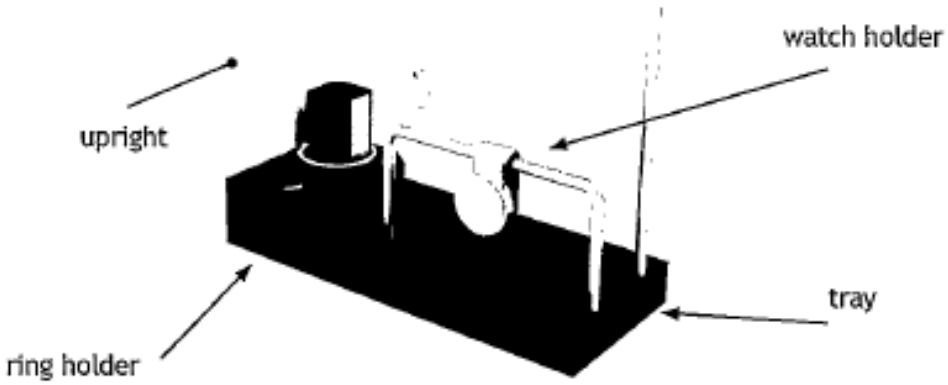
# Candidate 1 evidence

1. A design proposal for a jewellery organiser is shown below.


(a) The ring holder and tray were manufactured from a stained softwood.

(i) Name a suitable softwood for the ring holder and tray. 1

pine

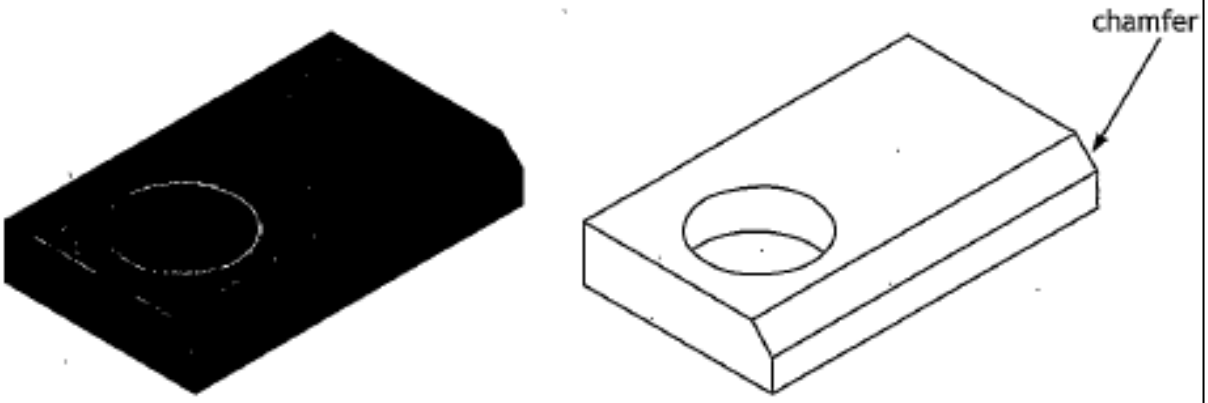
A flat-bottomed hole was drilled into the ring holder to store rings.

(ii) Name the suitable drill bit that could be used to drill a flat-bottomed hole. 1

pillar drill

1. (continued)

The edge of the ring holder was chamfered.




(iii) Name the suitable hand tool that could be used to create the chamfer. 1

rebate plane

**1. (continued)**

(b) The tray was manufactured using a corner rebate joint.

(i) Describe how the corner rebate joint could be marked and cut out accurately. You must refer to workshop tools in your answer. 4

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

- You would use a steel rule to measure the wood.
- then use a marking guage to mark the saw line. Mark the waste wood
- You would use a scrap peice as a guide line
- Then using a Sash cramp to keep it in place.
- Then use a hand router to clean the joint out.

1. (b) (continued)

(ii) Name another suitable joint that could be used for the corners of the tray. 1

lap joint

The tray was checked for squareness during assembly.

(iii) Outline two methods of checking the frame is square. 2

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

- Use a enigeer Square put it up against the wood and check if it is a 90° angle.
- Put it against a diffrent peice of wood that is the right size.

The softwood tray was assembled using an adhesive.

(iv) Name the appropriate adhesive for assembling the softwood tray. 1

Glue

[Turn over

**1. (b) (continued)**

All wooden components were prepared for a stained finish.

(v) Describe **three** stages in the preparation of the wooden components before applying stain. 3

- You would sand the wood first to make it nice and smooth.
- put white spirit on an old rag and rub it against the wood.
- let it dry before put the stained finish on.

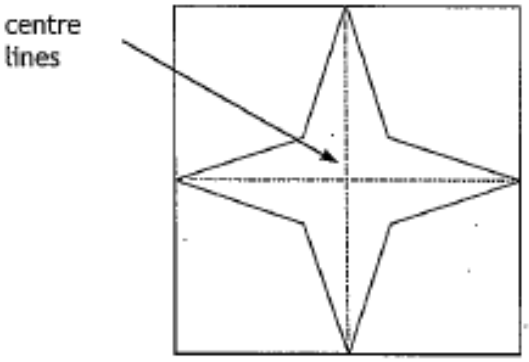
(c) The clock face was made from brass.

(i) State **two** reasons why brass is a suitable material for the clock face. 2

- Because it is long lasting and durable
- Brass doesn't rust so not alot of maintence.
- Brass is a non ferrous metal.

1. (c) (continued)

The brass clock face was marked out as shown below.




(ii) Describe how to mark out the centre lines of the clock face, with reference to workshop tools. 2

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

- You would use a steel rule to measure the line down and across of the star.
- Then once you find the centre you would use a centre punch to make and indent in the metal to know where to saw.

and a mallet would hit the centre punch.

A hand tool was used to cut out the star shape.

(iii) Name an appropriate hand tool that could be used to cut out the star. 1

tennon saw

[Turn over

1. **(continued)**

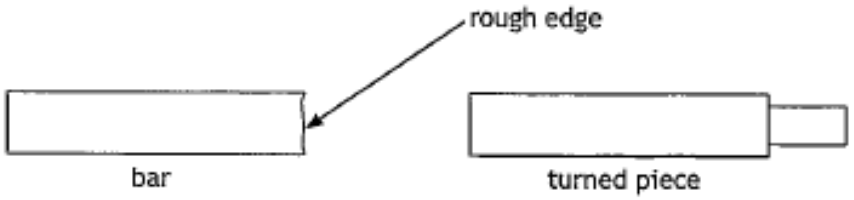
(d) The ends of the necklace hanger were turned on a centre lathe as shown below.

(i) Outline **two** safety checks that must be carried out on the centre lathe **before** turning. 2

- Check if the proctetive visor is down
- Check if the matiral fits the lathe tigh so it dosen't fall off during the process.

1. (d) (continued)

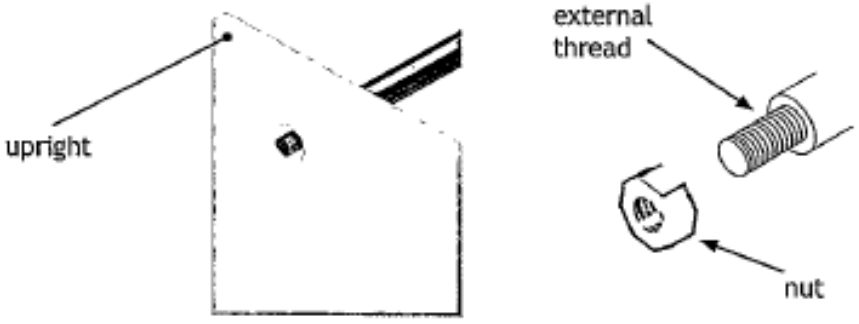
The bar was supplied as shown below.




(ii) Name **two** processes that would be carried out on the centre lathe to create the turned piece. 2

- Knurling
- Taper turning
- Chamfering

An external thread was cut on the end of the bar to allow it to be attached to the upright using a nut.



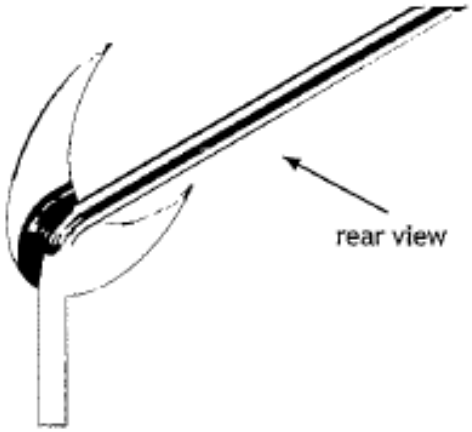

(iii) Describe **two** ways of ensuring a good quality thread is cut. 2

- Make sure the tap has grease on it so it is easier and a better theard.
- Make sure you turn the tap back and foward and not 360° turn or the theard will not be good.

[Turn over

1. (d) **(continued)**

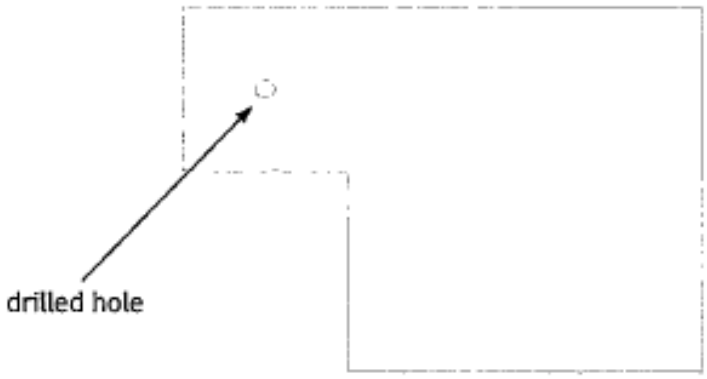
The brass moon was permanently joined to the brass bar.




(iv) Name a suitable adhesive for permanently joining the moon to the bar. 1

glue

(e) A hole was drilled in the acrylic upright to allow the clock mechanism to be held.

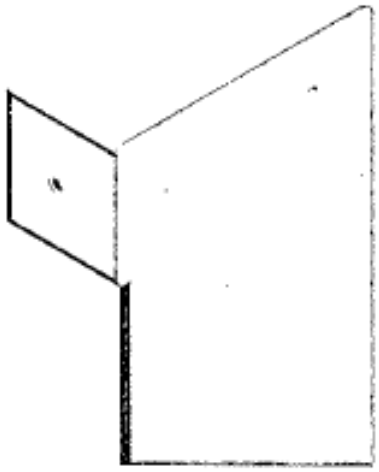



(i) Outline **one** method of preventing the acrylic cracking during drilling. 1

- Make Sure the drill fits the hole
- Don't take off protective plastic.

1. (e) (continued)

The upright was bent to a right angle as shown below.



(ii) Describe how the right-angled bend could be formed accurately, with reference to workshop tools. 2

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

- You would mark the line where you want heated with steel rule and pencil and heat this line with a strip heater then once the plastic is foldy you would rap it around a former and hold it there until it cools down and sets.

(iii) Explain why the hole was drilled in the upright before the bend was formed. 1

- so the arcylic didn't creack.
- It would be more accurate.

2. When carrying out research, a variety of methods can be used to gather information.

(a) Explain the benefits of using a questionnaire to gather information. 3

- Diffrent option from other people.
- You will get different answers for every question
- Desn't take a while to do.

After completing the research, a product specification can be produced.

(b) Describe how a specification can be used during the design process. 1

- To check if your design can do everything that is in your specification.

**3.** Brainstorming can be used as an idea generation technique.

(a) Describe the key stages of brainstorming. **3**

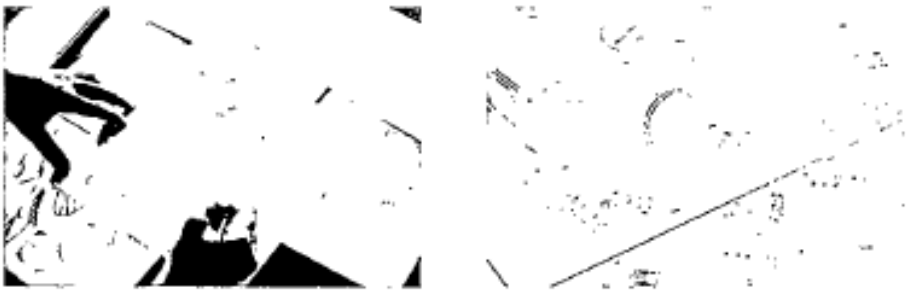
- Getting Ideas.
- What the product will look like
- What will it do

(b) Name another idea generation technique. **1**

mood board

[Turn over

4. Designers use graphic techniques at different stages of the design process.



(a) Outline **two** reasons why sketching is a suitable graphic technique to use when generating ideas. 2

- To get an idea of what it looks like.
- It is quick to do.
- And easily to do.

(b) Outline **two** reasons why a designer will produce working drawings during the planning for manufacture stage. 2

- To see what it will look like.
- To see all the diffrent function of the product.

**4. (continued)**

During the design process designers can use computer generated and physical models.

(c) Explain the benefits of using physical models such as sketch, scale or block models during the design process. 3

- You can see if it fits your hands with a sketch you can't hold it
- You can see how big the product is.
- You can see where diffrent add-ons like buttons will be placed on the controller

[Turn over

5. A kettle is shown below.

Describe how ergonomics may have influenced the design of the kettle. 4

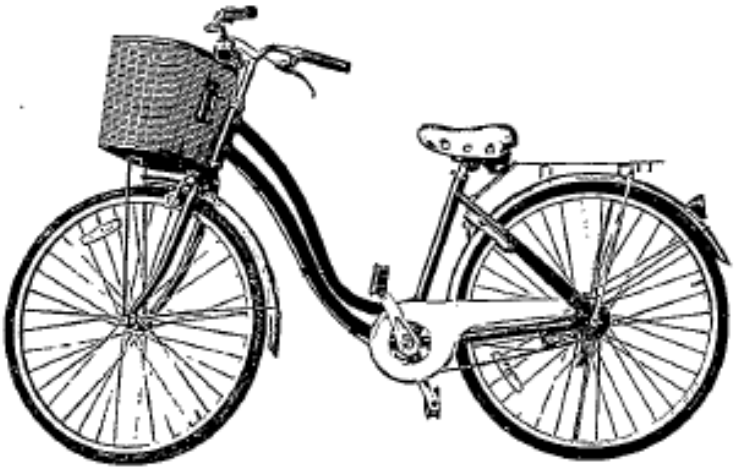
a That The handle will fit the width of a human hand.

b The button is easy to access while holding this kettle.

c Is it easy to lift or is it too heavy

c Is there enough space between the metal and the handle without burning yourself.

6. A bicycle is shown below.



*You must give different examples for (a) and (b).*

Describe how the following design factors may have influenced the design of the bicycle:

(a) safety. 3

- Is the handle to a height where you are able to be comfortable on the bike.
- Does the bike have saftey lights when cycling in the dark.
- Are the brakes easy to use so you don't fall off.

(b) function. 3

- Does the bike tyres run smoothly along diffent surfaces.
- Are the ~~people~~ pedals easy to reach and not too stif
- Can the basket hold a monjatie of items without falling and breaking.

7. Three clocks are shown below.

Clock A

Clock B

Clock C

(a) Describe how the clocks **compare** aesthetically. 3

*You should compare three different aesthetic aspects.*

- Clock A and C have bright colours which makes them eye catching too the buyer.
- Clock A has a bigger face which makes it easier to read.
- Clock B has alot more simply colours and old fashion which means not very many young people will buy this.

7. (continued)

Brand image is important to many companies.

(b) Describe **two** benefits of a strong brand image. 2

- So the person / buyer knows what brand they are buying.
- So it is more eye-catching for the buyer. So there is a better chance of them buying it.

[Turn over

8. Two mass manufactured taps are shown below.

Metal Tap

Plastic Tap

| Metals | Plastics |
|---|---|
| • Mild steel | • Acrylic |
| • Copper | • Urea formaldehyde |
| • Iron | • ABS |

*A different reason must be given for the suitability of each material.*

(a) A metal tap is shown above.

(i) Name the most suitable metal from the list provided. 1

Copper

(ii) State why the metal you have selected would be suitable for the tap. 1

due to it being non-ferrous and it will not rust

(b) A plastic tap is shown above.

(i) Name the most suitable plastic from the list provided. 1

Arcylic

(ii) State why the plastic you have selected would be suitable for the tap. 1

Because you can reheat it and bend it. And comes in wide range of colours.

8. **(continued)**

Mass manufacturing processes were used to produce the taps.

*You must give different responses in (c) and (d).*

(c) State **two** identifying features that would show the plastic tap was injection moulded. 2

- There would be marks left where the process had started.
- And it would be a light weight material
- And there would be cutting lines where it has bein cast.

(d) Outline **two** reasons why die casting is a suitable process for mass manufacturing the metal taps. 2

- Because they are all the same shape and size.
- Because it is quick and easy.

[Turn over

**8. (continued)**

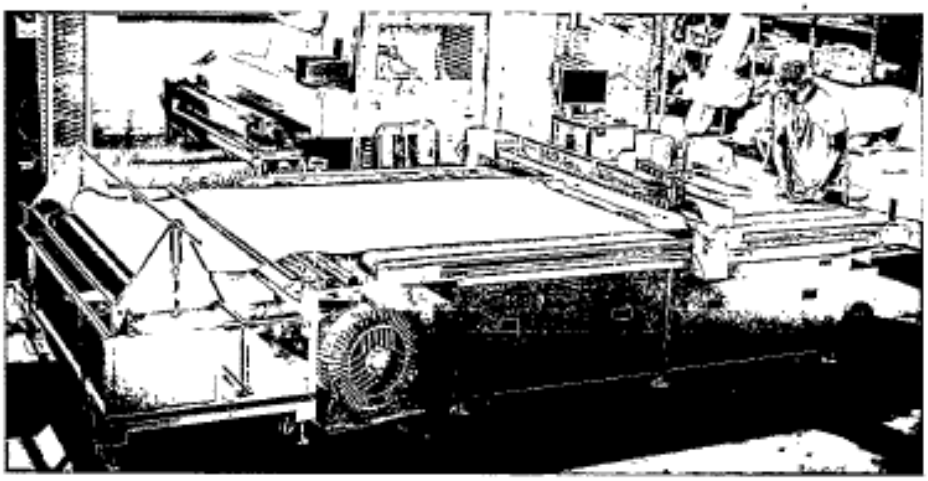
A thermoplastic water tank is shown below.

(e) Name an appropriate process to manufacture the thermoplastic water tank and state why it is suitable. **2**

Process Mass Manufacturing

Suitable because they are all the same shape and size. And they all have the same colour on the water tank.

9. Computer Aided Manufacture (CAM) is often used in the mass-manufacture of products.



(a) Explain the benefits of CAM to the manufacturer. 3

- It is quicker and more efficent.
- There is no mistake of human error.
- Less people have to get paided because it is robots and people will look for other jobs elsewhere.

Not all products can be mass-manufactured.

(b) Explain why some products are not suitable for mass-manufacture. 1

Because they may have a product that has certain little in dent or logo on it.

10. Manufacturers often use standard components such as the part shown below.

Outline the benefits of using standard components to the manufacturer. 3

- Standard Components are easier to use instead of making them from Scratch.
- Stanard Compenents means the full product can be manufactured quicker
- Standard Components are more long lasting and Sustainable.

**11.** Manufacturers have a responsibility to reduce landfill waste by extending product life expectancy.

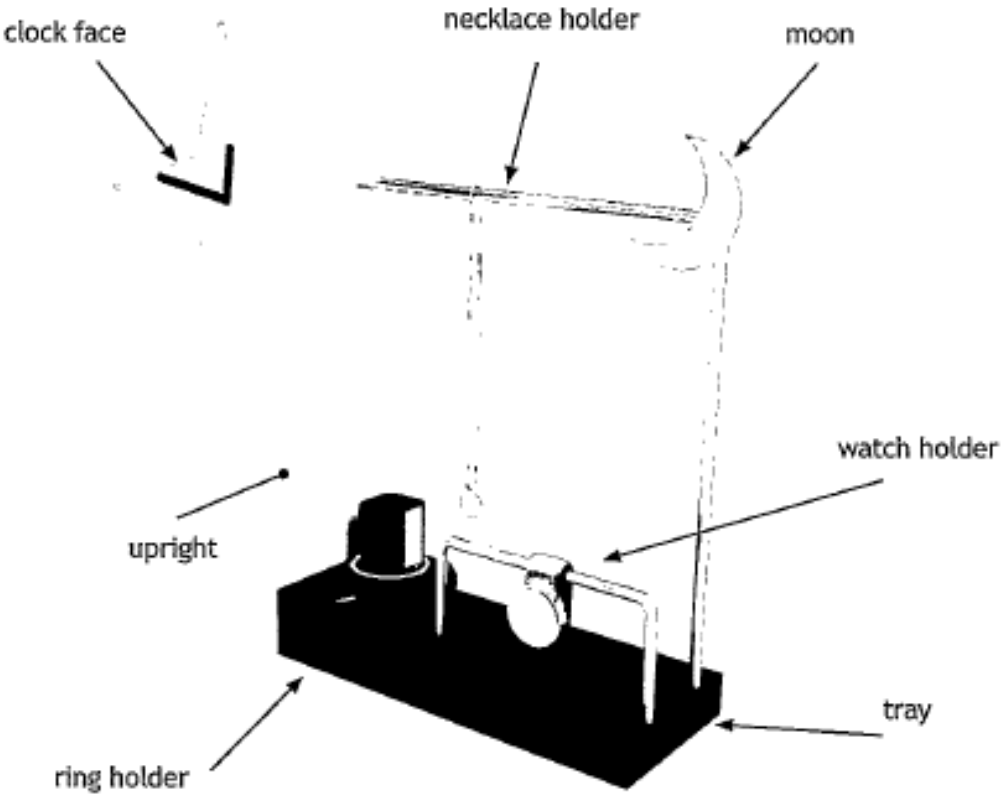
Outline **three** steps that manufacturers could take to extend the life expectancy of a product. 3

- Use a finish on a product that will make it more long lasting and Sustainable
- Use strong materials like ones that are non-ferrous because they don't rust like ferrous metals.
- They could use materials that are good for the environment

[END OF QUESTION PAPER]

## Candidate 2 evidence

1. A design proposal for a jewellery organiser is shown below.




(a) The ring holder and tray were manufactured from a stained softwood.

(i) Name a suitable softwood for the ring holder and tray. 1

mdf

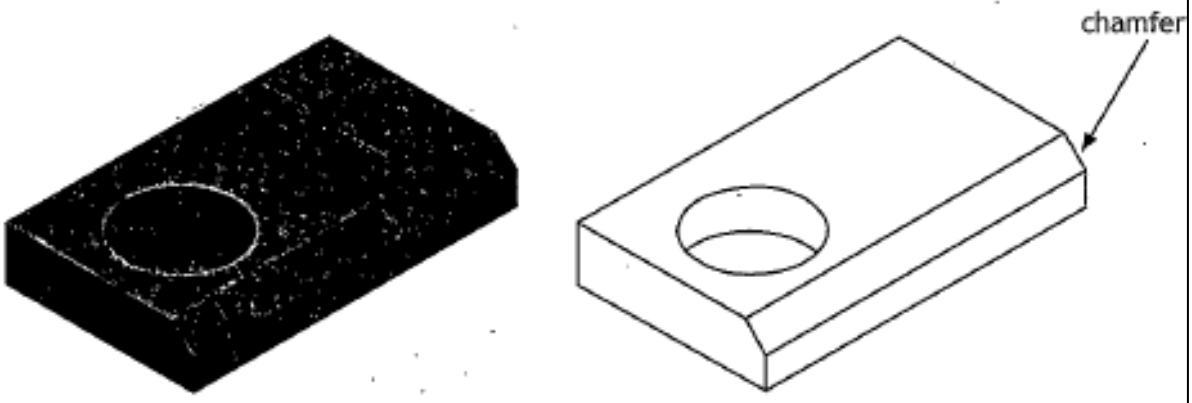
A flat-bottomed hole was drilled into the ring holder to store rings.

(ii) Name the suitable drill bit that could be used to drill a flat-bottomed hole. 1

forstener drill

1. (continued)

The edge of the ring holder was chamfered.

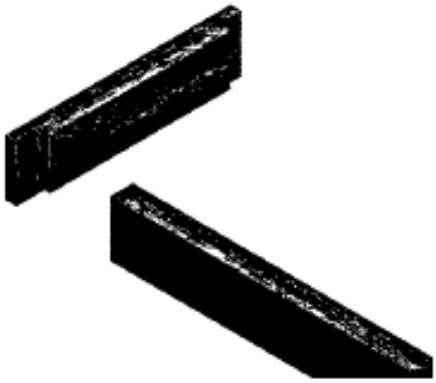



(iii) Name the suitable hand tool that could be used to create the chamfer. 1

Smoothing plane

1. **(continued)**

(b) The tray was manufactured using a corner rebate joint.



(i) Describe how the corner rebate joint could be marked **and** cut out accurately. You must refer to workshop tools in your answer. **4**

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

use a steel rule to mark out where the material should join.
use a tenon saw to cut the line.
use a chizel to help lift the material.
finally use a "granny's tooth" to get rid of any remaining material and to make the cut out a smooth surface to make the join strong.

1. (b) (continued)

(ii) Name another suitable joint that could be used for the corners of the tray. 1

through housing

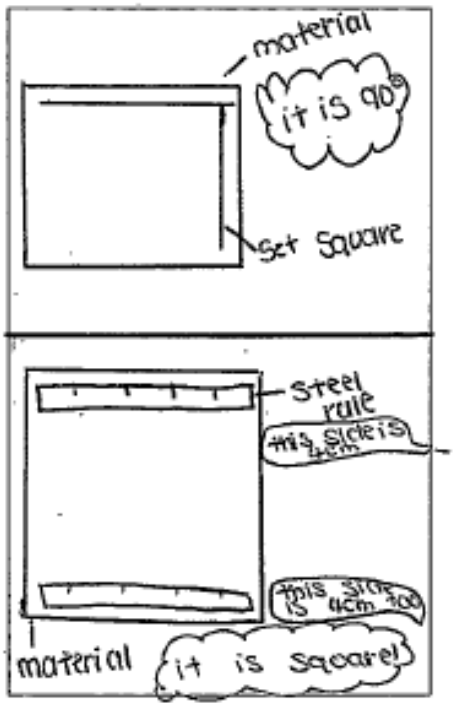
The tray was checked for squareness during assembly.

(iii) Outline two methods of checking the frame is square. 2

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

you Could check by using a Set Square to be sure the Corners are at 90° angles.

You Could also use a Steel rule to make sure opposite sides are the same Size as that would mean it's 90°




The softwood tray was assembled using an adhesive.

(iv) Name the appropriate adhesive for assembling the softwood tray. 1

wood glue

[Turn over

1. (b) (continued)

All wooden components were prepared for a stained finish.

(v) Describe **three** stages in the preparation of the wooden components before applying stain. 3

- sand the meterial down.
- prime the material using spray paint.
- use wet and dry ~~paper~~ paper on the product.

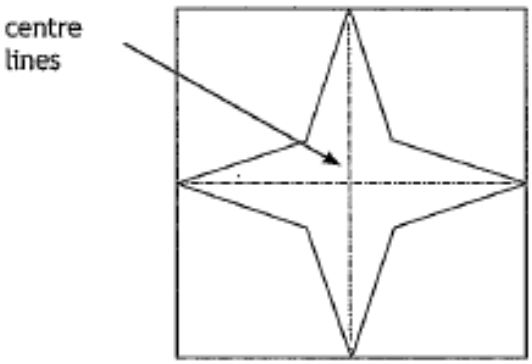
(c) The clock face was made from brass.

(i) State **two** reasons why brass is a suitable material for the clock face. 2

- it is easy to clean
- it is durable

1. (c) (continued)

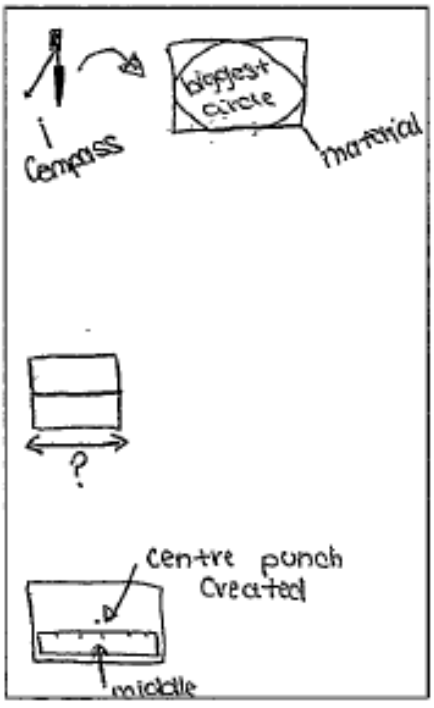
The brass clock face was marked out as shown below.




(ii) Describe how to mark out the centre lines of the clock face, with reference to workshop tools. 2

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

use a Compass to draw the biggest circle possible. Or measure with a steel rule to find the Correct length from Side to side. use a centre punch to mark where the middle of the square is




A hand tool was used to cut out the star shape.

(iii) Name an appropriate hand tool that could be used to cut out the star. 1

Tenon Saw

[Turn over

1. (continued)

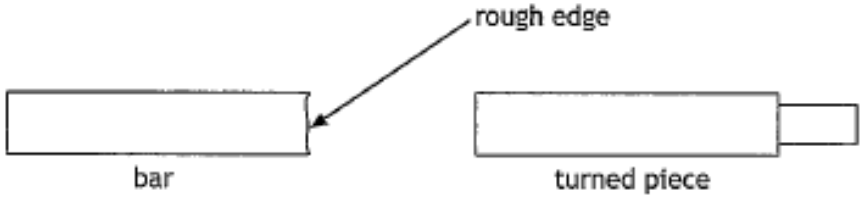
(d) The ends of the necklace hanger were turned on a centre lathe as shown below.

(i) Outline **two** safety checks that must be carried out on the centre lathe before turning. 2

- ensure the material is secured in place, so that when you turn the lathe on, the material doesn't fly out.
- make sure the lathe guard has been placed on so that people are protected.

1. (d) (continued)

The bar was supplied as shown below.

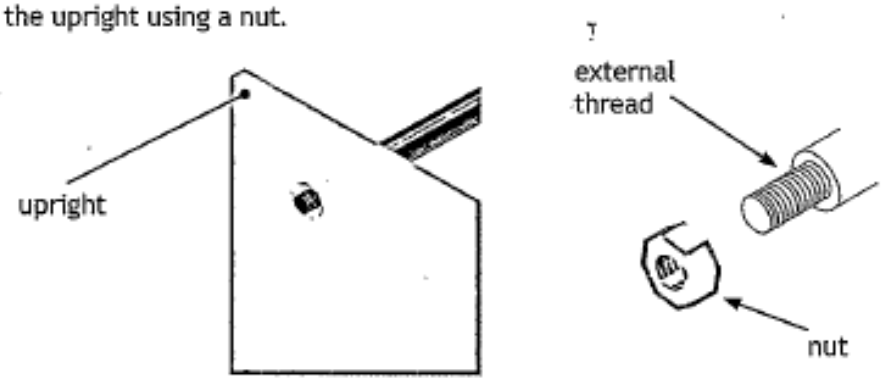



(ii) Name two processes that would be carried out on the centre lathe to create the turned piece. 2

Step turning

~~Cut~~ welding

An external thread was cut on the end of the bar to allow it to be attached to the upright using a nut.




(iii) Describe two ways of ensuring a good quality thread is cut. 2

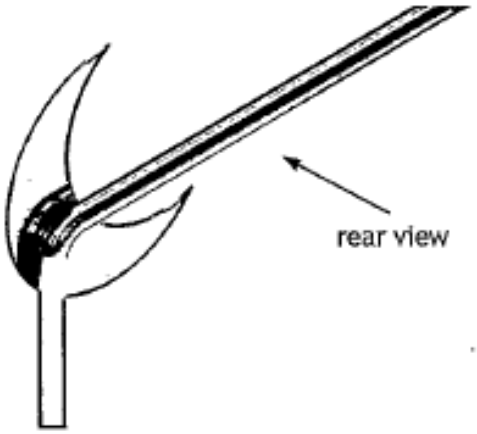
only twist 180° at a time. - taking your time can make the thread accurate.

make sure when your twisting you put the thing on a flat surface or in an engineers vice to prevent making mistakes.

[Turn over

1. (d) (continued)

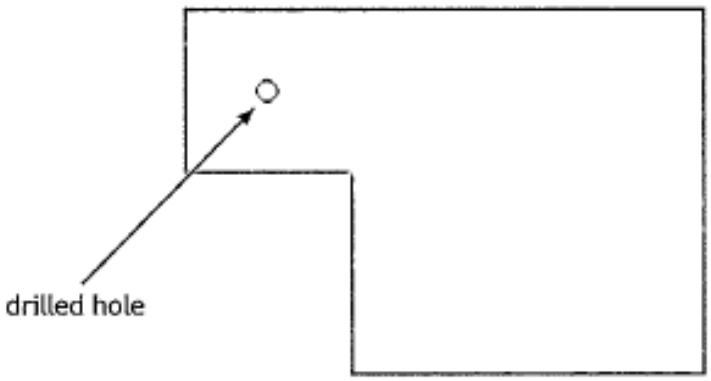
The brass moon was permanently joined to the brass bar.




(iv) Name a suitable adhesive for permanently joining the moon to the bar. 1

Super glue

(e) A hole was drilled in the acrylic upright to allow the clock mechanism to be held.

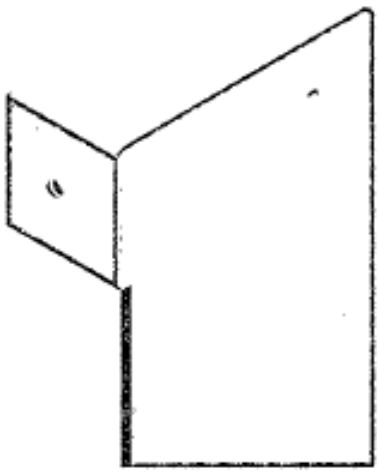



(i) Outline one method of preventing the acrylic cracking during drilling. 1

Cover the whole material in masking tape.

1. (e) (continued)

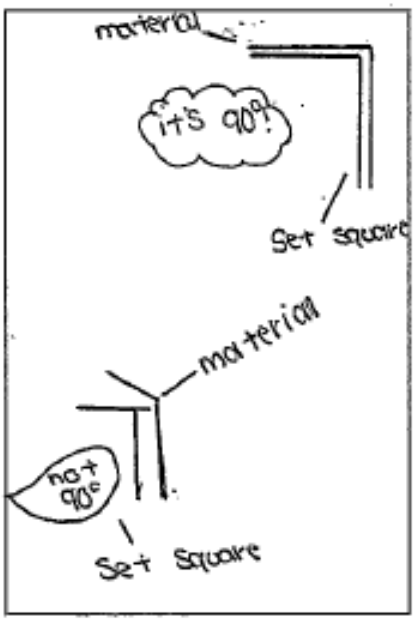
The upright was bent to a right angle as shown below.



(ii) Describe how the right-angled bend could be formed accurately, with reference to workshop tools. 2

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

use an a strip heater to warm the material up ready for moulding. - the find a 90° which could be a table and hold it there. You can check it is accurate by using a set square.




(iii) Explain why the hole was drilled in the upright before the bend was formed. 1

the other side of the material would get in the way.

2. When carrying out research, a variety of methods can be used to gather information.

(a) Explain the benefits of using a questionnaire to gather information. 3

- you can get other peoples opinions.
- you gain constructive feedback which can help make better changes to your product
- if loads of people find the same problem with the product then you should probably change it so the problem goes away and people don't have any negative comments to say about the design.

After completing the research, a product specification can be produced.

(b) Describe how a specification can be used during the design process. 1

it can be used as a checklist to make sure the product has all the things it should.

**3.** Brainstorming can be used as an idea generation technique.

(a) Describe the key stages of brainstorming. 3

write a topic or specification so that you create some boundaries and create something that is in the brief / on topic.
Scribble down every idea even if you think it's a rubbish idea because you can make it better later.
Organise your thoughts be possibley making a mind map so it's not too overwhelming.

(b) Name another idea generation technique. 1

messy sketching.

[Turn over

4. Designers use graphic techniques at different stages of the design process.

(a) Outline two reasons why sketching is a suitable graphic technique to use when generating ideas. 2

- it helps you to be able to communicate and talk with people so you can get feedback on your work.
- Sketching helps you be able to understand your own drawings and seeing if it will actually be possible

(b) Outline two reasons why a designer will produce working drawings during the planning for manufacture stage. 2

- to be able to know what sizes of material your going to need.
- to know what material you're going to use.

4. (continued)

During the design process designers can use computer generated and physical models.

(c) Explain the benefits of using physical models such as sketch, scale or block models during the design process. 3

* models can be used to test your design, to see if your products function actually works.
* models help you ~~emerge~~ decide what the best option for your design is.
* models can help you communicate your design and help you find flaws or problems which you can fix.

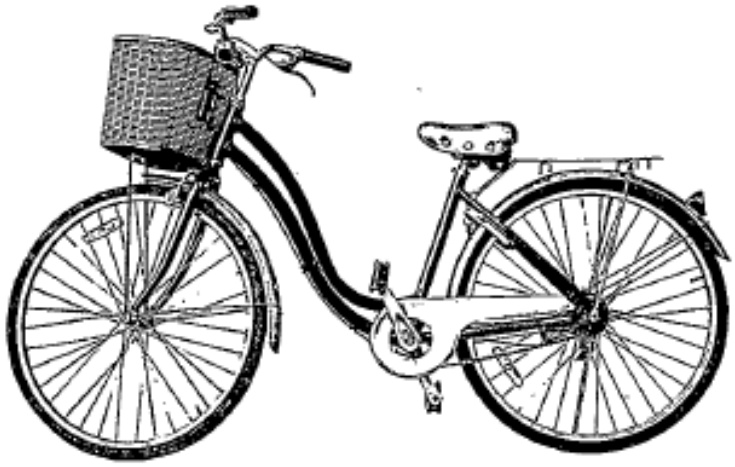
[Turn over

**5.** A kettle is shown below.

Describe how ergonomics may have influenced the design of the kettle. 4

- a persons hand size to be able to grip and lift the handle of the kettle.
- a persons finger size to push down the button to actually make the kettle work.
- the maximum water capacity is at 1·7 litres to make sure people can be able to lift the kettle to make a drink but also so the kettle doesn't overflow.
- the lid at the top must be able to open easily to make sure people don't struggle filling the kettle.

6. A bicycle is shown below.



*You must give different examples for (a) and (b).*

Describe how the following design factors may have influenced the design of the bicycle:

(a) safety. 3

- the handles of the bike shouldn't be too far away from the seat.
- the bike bell mustn't be too close to where a person would grip.
- the lights on the bike should go 360° around the bike.

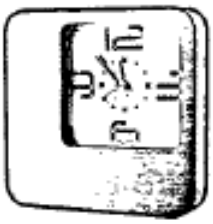
(b) function. 3

- the pedales of the bike must be a certain height of the ground.
- the seat should be adjustable so that people only have to buy one bike
- the wheels must be a certain length apart.

7. Three clocks are shown below.

Clock A

Clock B



Clock C

(a) Describe how the clocks compare aesthetically. 3

*You should compare **three** different aesthetic aspects.*

Clock A has 12 numbers which would help young children, clock B has 12 roman numerals which is only good if you understand them and clock C only has 4 numbers which would be difficult to read for children.

Clock A is a teal Colour which is welcoming so should go in a school, B is brown and should go on a fire place, C is pink and bright which should go in childrens bedrooms.

A is wall mounted, B is free standing, C is also freestanding but doesn't look as safe.

7. (continued)

Brand image is important to many companies.

(b) Describe **two** benefits of a strong brand image. 2

- Certain brands can become more popular or trendy and other people will buy it to join the trend.
- people want to fit in.

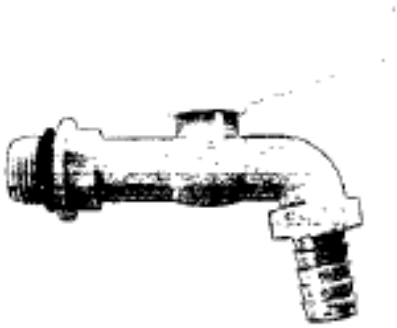
[Turn over

8. Two mass manufactured taps are shown below.

Metal Tap

Metals
- Mild steel
- Copper
- Iron

Plastic Tap



Plastics
- Acrylic
- Urea formaldehyde
- ABS

*A different reason must be given for the suitability of each material.*

(a) A metal tap is shown above.

(i) Name the most suitable metal from the list provided. 1

Copper

(ii) State why the metal you have selected would be suitable for the tap. 1

it's Strong / durable

(b) A plastic tap is shown above.

(i) Name the most suitable plastic from the list provided. 1

Acrylic

(ii) State why the plastic you have selected would be suitable for the tap. 1

Comes in loads of different colours.

8. **(continued)**

Mass manufacturing processes were used to produce the taps.

*You must give different responses in (c) and (d).*

(c) State **two** identifying features that would show the plastic tap was injection moulded. **2**

- ejection marks
- moold split lines

(d) Outline **two** reasons why die casting is a suitable process for mass manufacturing the metal taps. **2**

- it is quick
- it makes everything identicle.

[Turn over

**8. (continued)**

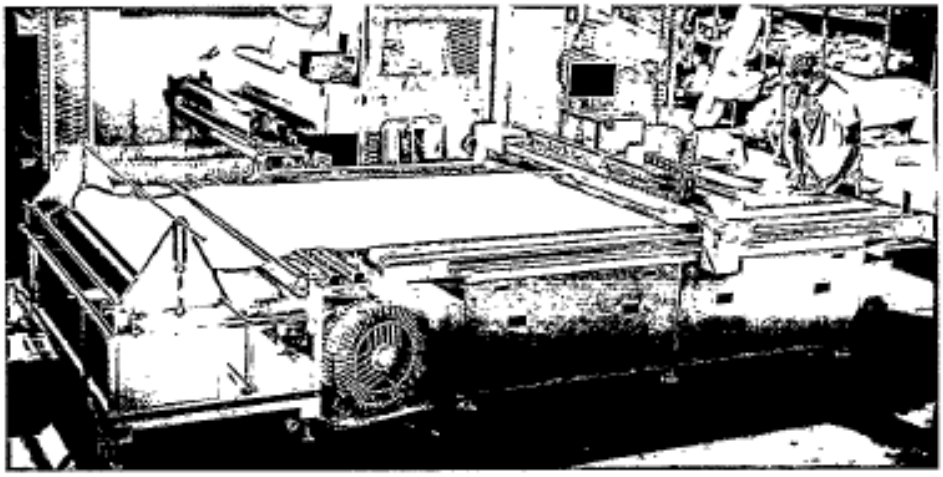
A thermoplastic water tank is shown below.

(e) Name an appropriate process to manufacture the thermoplastic water tank and state why it is suitable. **2**

Process rotational moulding

Suitable because the water tank is hollow. the water tank is big and rotational moulding is able to create big products.

9. Computer Aided Manufacture (CAM) is often used in the mass-manufacture of products.



(a) Explain the benefits of CAM to the manufacturer. 3

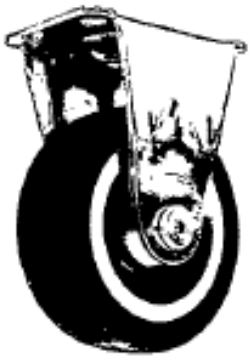
- it is suitable for mass production because it's so quick.

Not all products can be mass-manufactured.

(b) Explain why some products are not suitable for mass-manufacture. 1

- Some products can be a one-off product to be limited edition.

10. Manufacturers often use standard components such as the part shown below.



Outline the benefits of using standard components to the manufacturer. 3

- normally standard components are easy to buy as suppliers are stocked up on things that are most in demand at that moment.
- Standard components are basic so are relatively cheap to purchase.
- Standard components are easy to make and people are then able to buy in bulk.

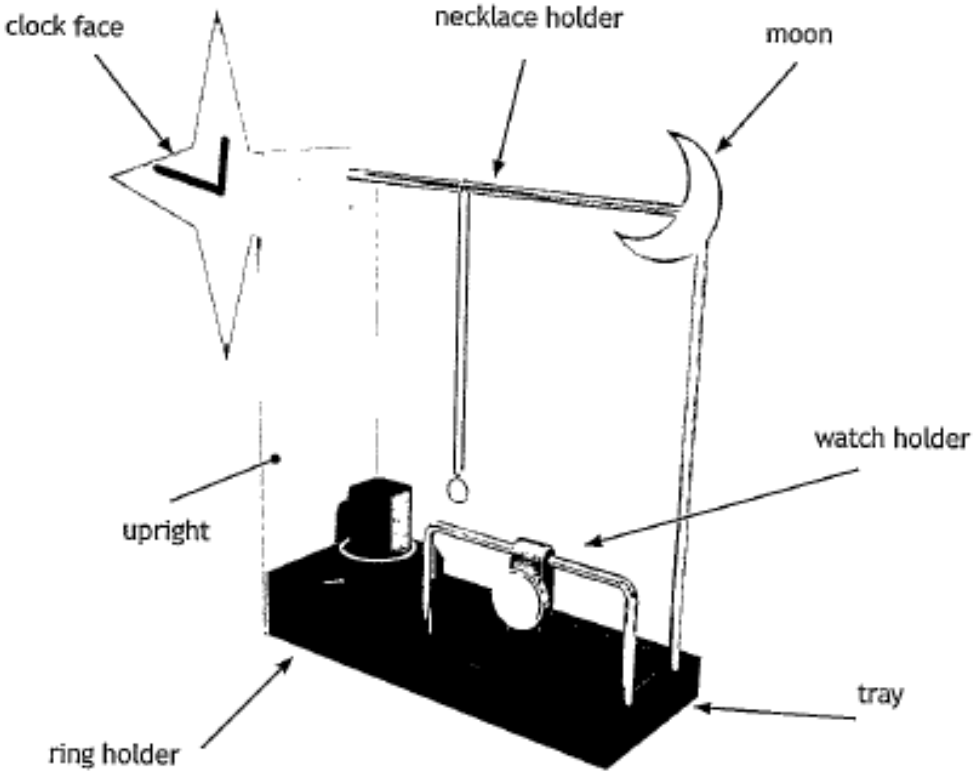
**11.** Manufacturers have a responsibility to reduce landfill waste by extending product life expectancy.

Outline **three** steps that manufacturers could take to extend the life expectancy of a product. 3

- test the product before it gets sold.
- use high quality materials and parts so it's likely to last longer.

# Candidate 3 evidence

1. A design proposal for a jewellery organiser is shown below.




(a) The ring holder and tray were manufactured from a stained softwood.

(i) Name a suitable softwood for the ring holder and tray. 1

Red pine

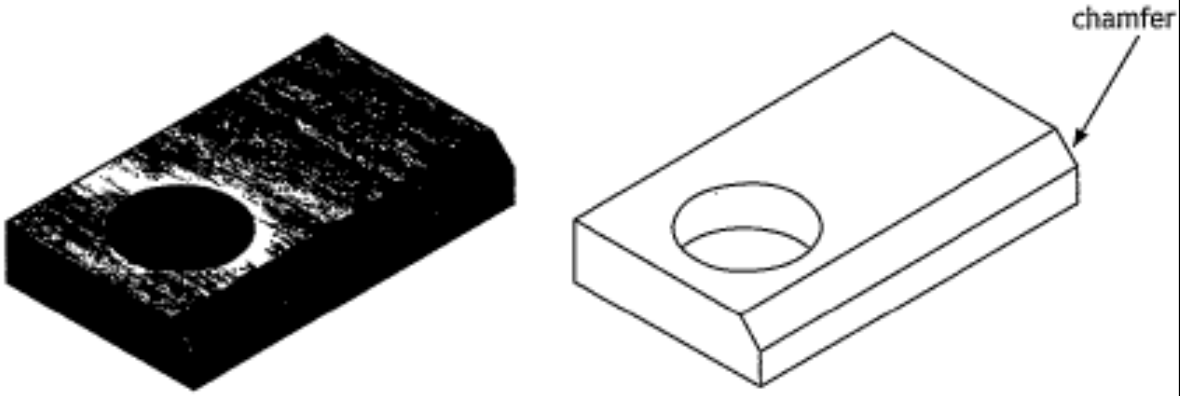
A flat-bottomed hole was drilled into the ring holder to store rings.

(ii) Name the suitable drill bit that could be used to drill a flat-bottomed hole. 1

forstner bit

1. (continued)

The edge of the ring holder was chamfered.




(iii) Name the suitable hand tool that could be used to create the chamfer. 1

Jack plane

1. (continued)

(b) The tray was manufactured using a corner rebate joint.

(i) Describe how the corner rebate joint could be marked and cut out accurately. You must refer to workshop tools in your answer. 4

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

First of you're
making gauge
to 12mm the
score the top
of the wood,
secondly use
the marking
gauge to half
the thickness
of the wood
and mark
the wood's side
up to 12mm
up. The use a
tenor or flush cut saw
to cut a line half way
into the wood,
and finally use
chisle to remove the
remaining waste material

1. (b) (continued)

(ii) Name another suitable joint that could be used for the corners of the tray. 1

dovetail joint

The tray was checked for squareness during assembly.

(iii) Outline two methods of checking the frame is square. 2

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

use a try-square to check the corners and use a template

The softwood tray was assembled using an adhesive.

(iv) Name the appropriate adhesive for assembling the softwood tray. 1

PVA

[Turn over

1. (b) **(continued)**

All wooden components were prepared for a stained finish.

(v) Describe **three** stages in the preparation of the wooden components before applying stain. 3

sand the wood with low and high grit sand paper. remove any dust and wet the wood.

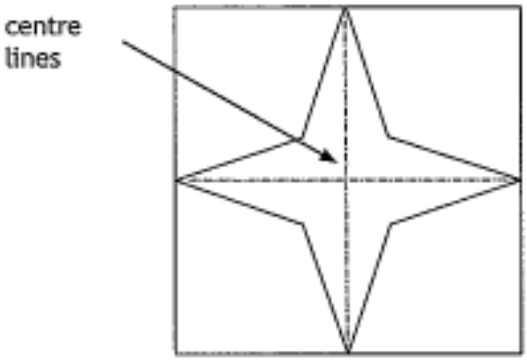
(c) The clock face was made from brass.

(i) State two reasons why brass is a suitable material for the clock face. 2

brass is easy to source and easy to work with

**1. (c) (continued)**

The brass clock face was marked out as shown below.




(ii) Describe how to mark out the centre lines of the clock face, with reference to workshop tools. **2**

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

use a steel rule to find the centre then use a scribber to scribe the lines.

A hand tool was used to cut out the star shape.

(iii) Name an appropriate hand tool that could be used to cut out the star. **1**

hacksaw

[Turn over

1. **(continued)**

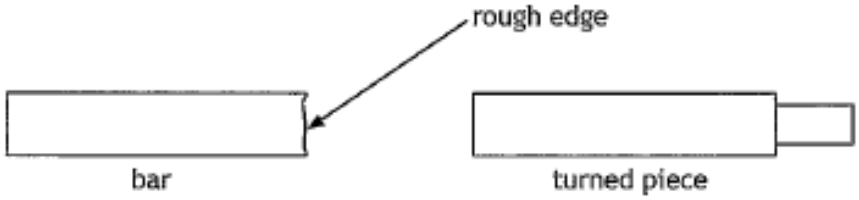
(d) The ends of the necklace hanger were turned on a centre lathe as shown below.

(i) Outline **two** safety checks that must be carried out on the centre lathe **before** turning. 2

make sure the drill bit is secure in place and make sure the material is secure in the lathe

1. (d) (continued)

The bar was supplied as shown below.




(ii) Name **two** processes that would be carried out on the centre lathe to create the turned piece. 2

Parallel turning and s

An external thread was cut on the end of the bar to allow it to be attached to the upright using a nut.

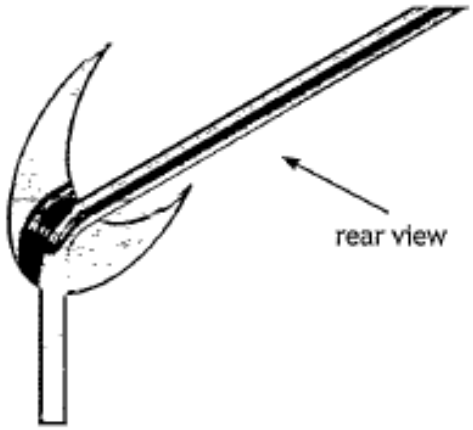

(iii) Describe **two** ways of ensuring a good quality thread is cut. 2

make sure the dies used are sharp

[Turn over

1. (d) (continued)

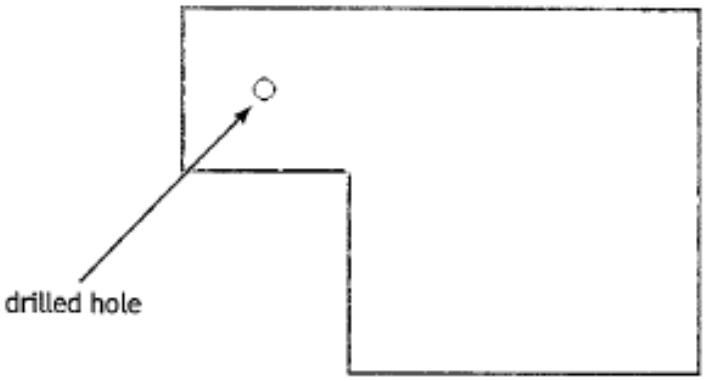
The brass moon was permanently joined to the brass bar.




(iv) Name a suitable adhesive for permanently joining the moon to the bar. 1

Super glue

(e) A hole was drilled in the acrylic upright to allow the clock mechanism to be held.

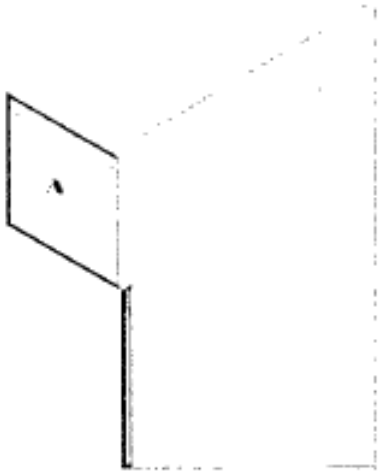



(i) Outline one method of preventing the acrylic cracking during drilling. 1

make sure the hole is drilled slowley and the acrylic is secure,

1. (e) (continued)

The upright was bent to a right angle as shown below.



(ii) Describe how the right-angled bend could be formed accurately, with reference to workshop tools. 2

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

use a strip heater to heat up a strip of the plastic. Then bend the ~~plastic~~ a plastic and hold in vice till it sets

(iii) Explain why the hole was drilled in the upright before the bend was formed. 1

so it is less a less chance of the acrylic cracking

2. When carrying out research, a variety of methods can be used to gather information.

(a) Explain the benefits of using a questionnaire to gather information. 3

you can gather information from a wide range of people. the question can be written so suite a target audience. the results are easy to present

After completing the research, a product specification can be produced.

(b) Describe how a specification can be used during the design process. 1

it can be use as a check list ~~for~~ on what the model should be and do

3. Brainstorming can be used as an idea generation technique.

(a) Describe the key stages of brainstorming. 3

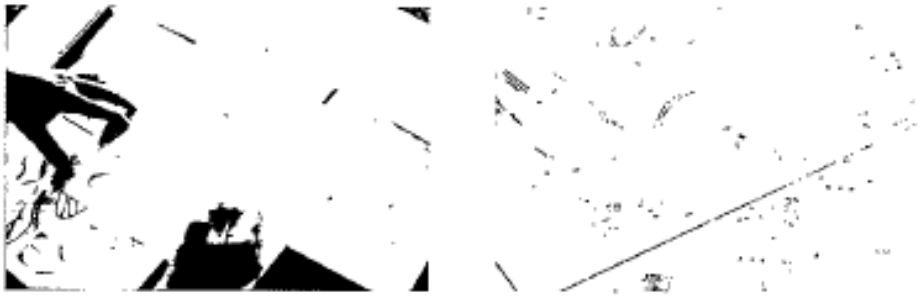
its a group activity where there are no silly ideas and ideas should bounce of eachother

(b) Name another idea generation technique. 1

sending the pencil for a walk

[Turn over

4. Designers use graphic techniques at different stages of the design process.



(a) Outline **two** reasons why sketching is a suitable graphic technique to use when generating ideas. 2

it's quick and give a rough idea of what the model will look like

(b) Outline **two** reasons why a designer will produce working drawings during the planning for manufacture stage. 2

~~It's quick to make it easier~~ to let the manufacturers see how the parts fit together and allows ideas to be refined

4. **(continued)**

During the design process designers can use computer generated and physical models.

(c) Explain the benefits of using physical models such as sketch, scale or block models during the design process. 3

it gives a better understanding of the model. It make it easier to generate ideas and refine ideas.

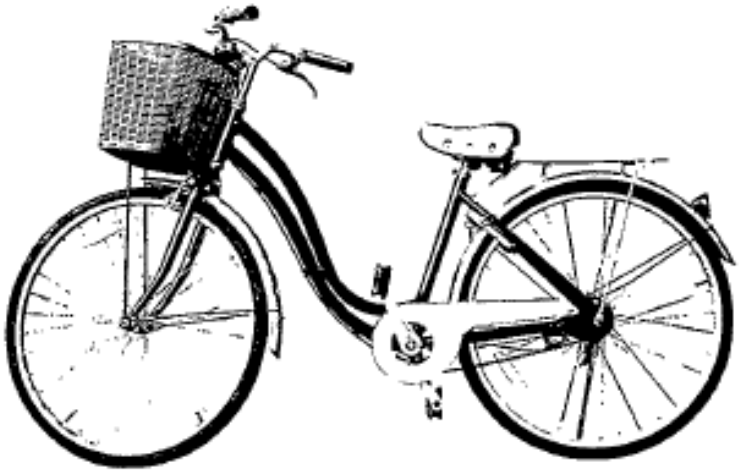
[Turn over

**5.** A kettle is shown below.

Describe how ergonomics may have influenced the design of the kettle. 4

the size of the kettle, how heavy it is, the size of the handel and buttons arent hard to press

6. A bicycle is shown below.



*You must give different examples for (a) and (b).*

Describe how the following design factors may have influenced the design of the bicycle:

(a) safety. 3

brakes were added, the break arent hard to press and there is nothing sharp sticking out

(b) function. 3

a basket was added for storage. the frame is low so you can get on and of it easily. the material is leather and scrape resistent

7. Three clocks are shown below.

Clock A

Clock B

Clock C

(a) Describe how the clocks **compare** aesthetically. 3

*You should compare three different aesthetic aspects.*

clock c is more modern than clock B. clock B is the only one made of wood and clock c is the only square one

**7. (continued)**

Brand image is important to many companies.

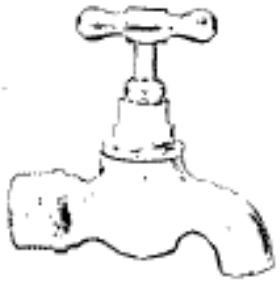
(b) Describe two benefits of a strong brand image. 2

premium prices and customer loyalty

[Turn over

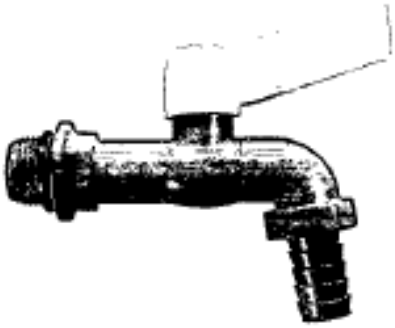
8. Two mass manufactured taps are shown below.

Metal Tap



Metals
- Mild steel
- Copper
- Iron

Plastic Tap



Plastics
- Acrylic
- Urea formaldehyde
- ABS

*A different reason must be given for the suitability of each material.*

(a) A metal tap is shown above.

(i) Name the most suitable metal from the list provided. 1

copper mild steel

(ii) State why the metal you have selected would be suitable for the tap. 1

is doesnt rust

(b) A plastic tap is shown above.

(i) Name the most suitable plastic from the list provided. 1

ABS

(ii) State why the plastic you have selected would be suitable for the tap. 1

is strong and durabil

**8. (continued)**

Mass manufacturing processes were used to produce the taps.

*You must give different responses in (c) and (d).*

(c) State **two** identifying features that would show the plastic tap was injection moulded. 2

injection mould> and split lines

(d) Outline **two** reasons why die casting is a suitable process for mass manufacturing the metal taps. 2

it is easy when making more than one and ~~cost~~ accurate.

[Turn over

**8. (continued)**

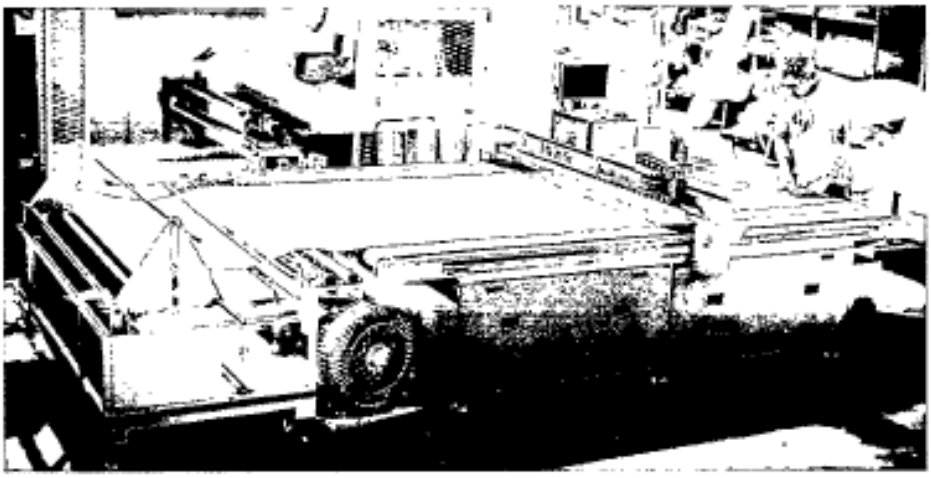
A thermoplastic water tank is shown below.

(e) Name an appropriate process to manufacture the thermoplastic water tank **and** state why it is suitable. **2**

Process vacuum ~~forming~~ moulding

Suitable because can be done easily and ~~very~~ efficently

9. Computer Aided Manufacture (CAM) is often used in the mass-manufacture of products.



(a) Explain the benefits of CAM to the manufacturer. 3

can produce mass amounts. Is less labor intensive and is accurate

Not all products can be mass-manufactured.

(b) Explain why some products are not suitable for mass-manufacture. 1

it requires a skilled craftsmen so make it

10. Manufacturers often use standard components such as the part shown below.

Outline the benefits of using standard components to the manufacturer. 3

can be repaired easily.
can fit a wide rage
of things and is cheaper.

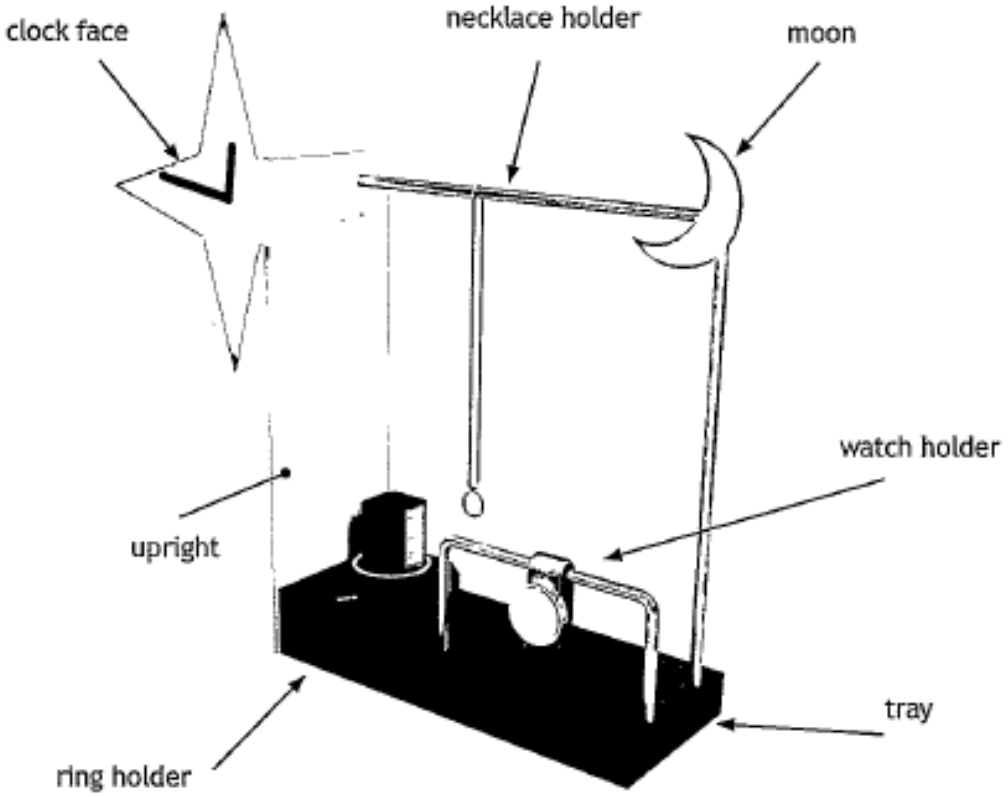
11. Manufacturers have a responsibility to reduce landfill waste by extending product life expectancy.

Outline **three** steps that manufacturers could take to extend the life expectancy of a product. 3

use recycled material, use sustainable power and reduce ~~packing~~ packige sized

## Candidate 4 evidence

1. A design proposal for a jewellery organiser is shown below.




(a) The ring holder and tray were manufactured from a stained softwood.

(i) Name a suitable softwood for the ring holder and tray. 1

Spruce

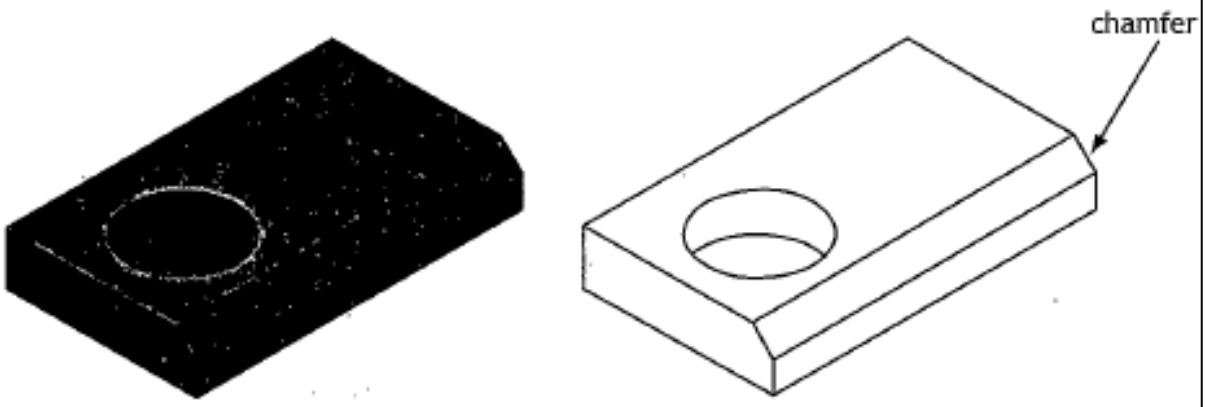
A flat-bottomed hole was drilled into the ring holder to store rings.

(ii) Name the suitable drill bit that could be used to drill a flat-bottomed hole. 1

forstner bit

1. **(continued)**

The edge of the ring holder was chamfered.

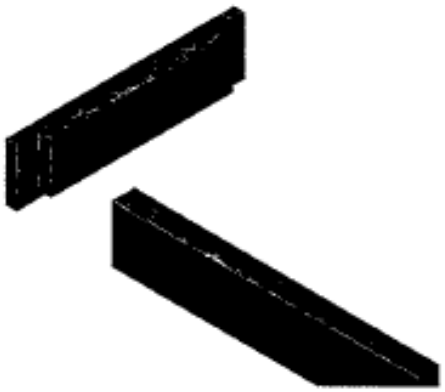



(iii) Name the suitable hand tool that could be used to create the chamfer. **1**

Jack plane

1. **(continued)**

(b) The tray was manufactured using a corner rebate joint.



(i) Describe how the corner rebate joint could be marked **and** cut out accurately. You must refer to workshop tools in your answer. **4**

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

- Use steel rule and pencil to mark dimensions of joint
- use marking gauge to mark half the width of the wood
- use a try square to draw lines at 90° angles to edge
- use tenon saw to cut down the lines.

1. (b) (continued)

(ii) Name another suitable joint that could be used for the corners of the tray. 1

finger joint

The tray was checked for squareness during assembly.

(iii) Outline two methods of checking the frame is square. 2

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

- Checking each corner is at 90° with a protractor
- Using a try square

The softwood tray was assembled using an adhesive.

(iv) Name the appropriate adhesive for assembling the softwood tray. 1

PVA

[Turn over

1. (b) (continued)

All wooden components were prepared for a stained finish.

(v) Describe **three** stages in the preparation of the wooden components before applying stain. 3

- sand pencil marks and blemishes off of wood with sandpaper
- file edges to smooth surface of wood
- ~~brasso~~ sandpaper
- remove any glue runs

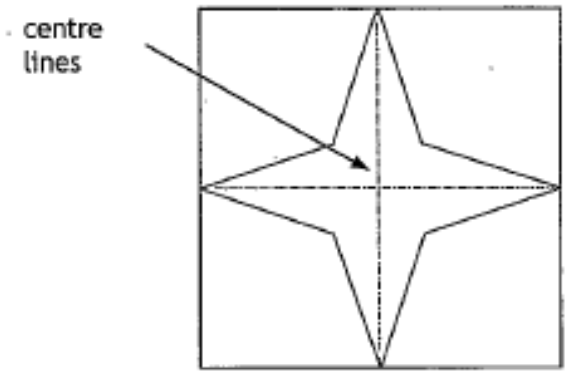
(c) The clock face was made from brass.

(i) State **two** reasons why brass is a suitable material for the clock face. 2

- its corrosion resistant
- its durable

1. (c) (continued)

The brass clock face was marked out as shown below.




(ii) Describe how to mark out the centre lines of the clock face, with reference to workshop tools. 2

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

-use scribe and steel rule to mark ~~measurements~~ the middle point. Use engineers square to mark lines on the brass

A hand tool was used to cut out the star shape.

(iii) Name an appropriate hand tool that could be used to cut out the star. 1

hacksaw

**1. (continued)**

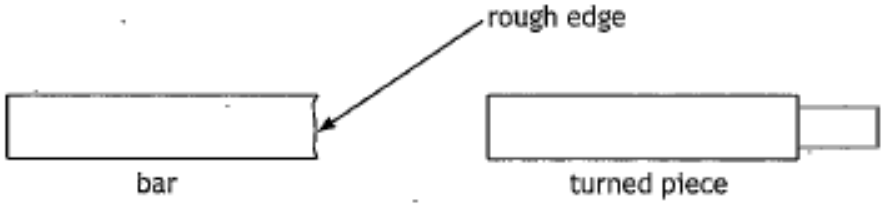
(d) The ends of the necklace hanger were turned on a centre lathe as shown below.

(i) Outline **two** safety checks that must be carried out on the centre lathe **before** turning. 2

- The tool rest is secure
- Safety goggles goggles are worn

1. (d) (continued)

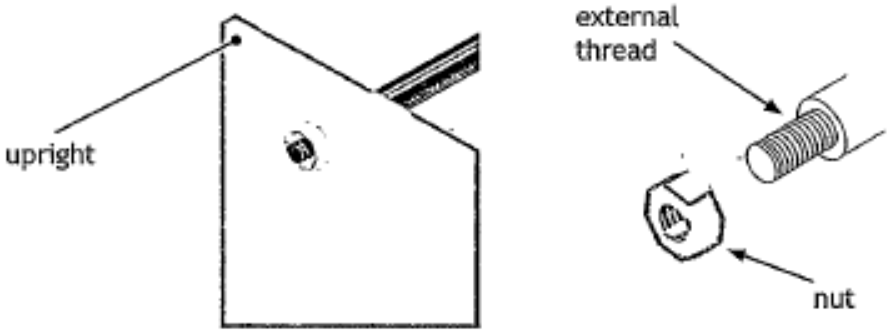
The bar was supplied as shown below.




(ii) Name two processes that would be carried out on the centre lathe to create the turned piece. 2

- parallel turning
- facing
- parting off

An external thread was cut on the end of the bar to allow it to be attached to the upright using a nut.

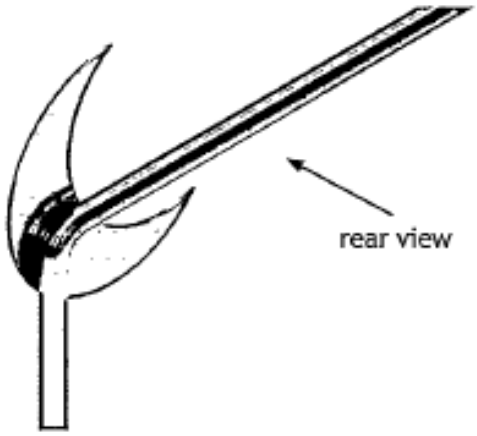



(iii) Describe two ways of ensuring a good quality thread is cut. 2

- ~~marker~~ increasing speed of machine
- keeping the bar steady

1. (d) (continued)

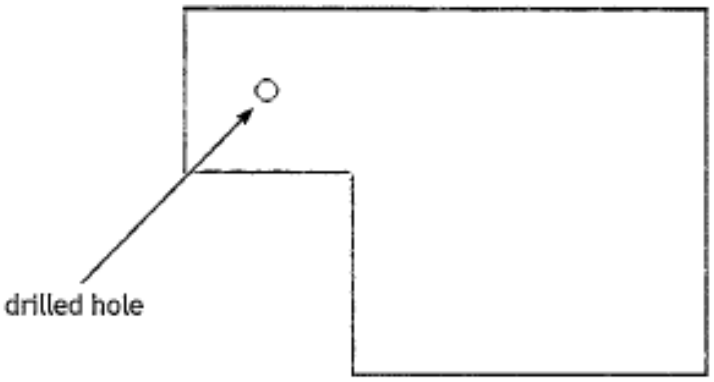
The brass moon was permanently joined to the brass bar.




(iv) Name a suitable adhesive for permanently joining the moon to the bar. 1

- Spot welding

(e) A hole was drilled in the acrylic upright to allow the clock mechanism to be held.

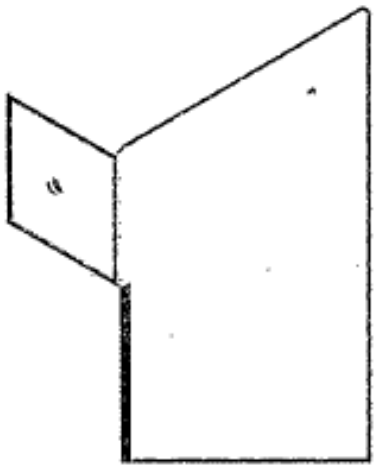



(i) Outline **one** method of preventing the acrylic cracking during drilling. 1

-using a stepped drill bit-

**1. (e) (continued)**

The upright was bent to a right angle as shown below.



(ii) Describe how the right-angled bend could be formed accurately, with reference to workshop tools. **2**

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

- use a pen and steel rule to mark fold lines
- use strip heater to heat plastic then bend to a 90° angle

(iii) Explain why the hole was drilled in the upright before the bend was formed. **1**

- to prevent plastic cracking

2. When carrying out research, a variety of methods can be used to gather information.

(a) Explain the benefits of using a questionnaire to gather information. 3

- allows the public to tell designers what is needed on a product
- allows open ended questions to be asked
- allows designers to gather more information

After completing the research, a product specification can be produced.

(b) Describe how a specification can be used during the design process. 1

- to show a designer what a product must do

3. Brainstorming can be used as an idea generation technique.

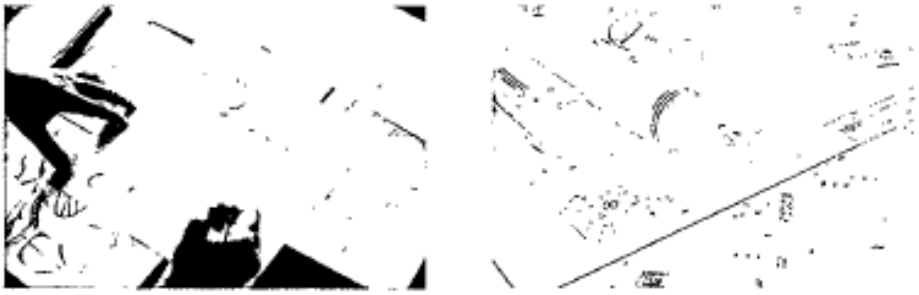
(a) Describe the key stages of brainstorming. 3

- topic is written on the middle of peece of paper and placed in middle of group.
+ ideas are shouted out and written on the paper
- this continues to all ideas have been written down

(b) Name another idea generation technique. 1

- morphological analysis

4. Designers use graphic techniques at different stages of the design process.



(a) Outline **two** reasons why sketching is a suitable graphic technique to use when generating ideas. 2

- It generates lots of ideas quickly
- It allows designers to show customers what a product could look like

(b) Outline **two** reasons why a designer will produce working drawings during the planning for manufacture stage. 2

- to show manufacturers what a product will look like.
- To show manufacturers the dimensions of a product.

4. (continued)

During the design process designers can use computer generated and physical models.

(c) Explain the benefits of using physical models such as sketch, scale or block models during the design process. 3

- to test demensions of a product
- to test the function of a product
- to show what a product like
- to show what a product could look like during

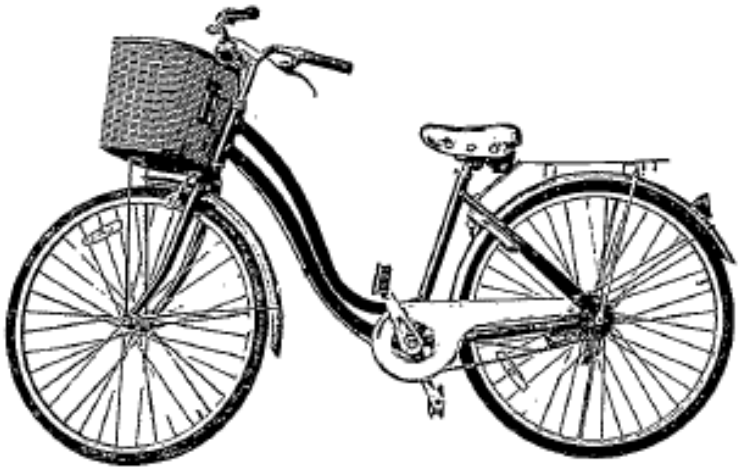
[Turn over

**5.** A kettle is shown below.

Describe how ergonomics may have influenced the design of the kettle. 4

- the switch clicks when the water has reached boiling
- the handle is big enough to fit 95th percentile hands
- the kettle is light enough so that it can be lifted easily
- the switch is easy to push down

6. A bicycle is shown below.



*You must give different examples for (a) and (b).*

Describe how the following design factors may have influenced the design of the bicycle:

(a) safety. 3

- the bike has breaks
- the bike has lights
- the bike has handlebars to hold onto
- the bike has lights

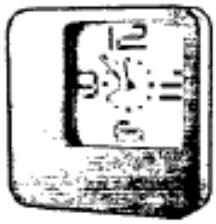
(b) function. 3

- the bike can be stopped
- the bike is easy to move
- the bike can be sat on
- the bike has a basket to hold things

**7.** Three clocks are shown below.

Clock A

Clock B



Clock C

(a) Describe how the clocks **compare** aesthetically. 3

*You should compare **three** different aesthetic aspects.*

- Clock A has a organic shape whereas clock C has a geometric shape
- Clock B has a dark colour whereas clock A is
- Clock B is vintage whereas clock A is more modern
- Clock B appears more vintage whereas clock A appears modern
- Clock C appears to have a smooth texture whereas clock A appears more rough.

7. (continued)

Brand image is important to many companies.

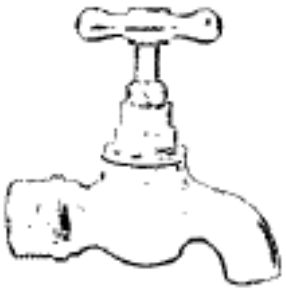
(b) Describe **two** benefits of a strong brand image. 2

- People are more likely to buy a product from a brand they recognise
- people are more likely to buy products from a brand they have ~~from~~ bought products from before

[Turn over

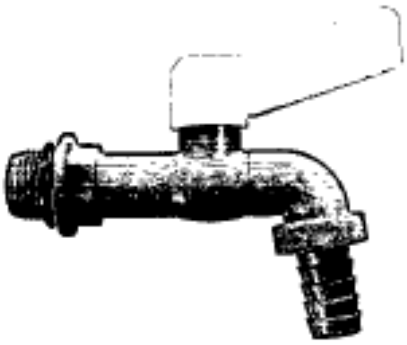
**8.** Two mass manufactured taps are shown below.

Metal Tap



Metals
- Mild steel
- Copper
- Iron

Plastic Tap



Plastics
- Acrylic
- Urea formaldehyde
- ABS

*A different reason must be given for the suitability of each material.*

(a) A metal tap is shown above.

(i) Name the most suitable metal from the list provided. 1

- Copper

(ii) State why the metal you have selected would be suitable for the tap. 1

- is corrosion resistant

(b) A plastic tap is shown above.

(i) Name the most suitable plastic from the list provided. 1

- ABS

(ii) State why the plastic you have selected would be suitable for the tap. 1

Can come in a variety of colors

8. **(continued)**

Mass manufacturing processes were used to produce the taps.

*You must give different responses in (c) and (d).*

(c) State **two** identifying features that would show the plastic tap was injection moulded. **2**

- injection points
- both mould split lines

(d) Outline **two** reasons why die casting is a suitable process for mass manufacturing the metal taps. **2**

- creates a smooth finish
- tap has a simple design

[Turn over

8. (continued)

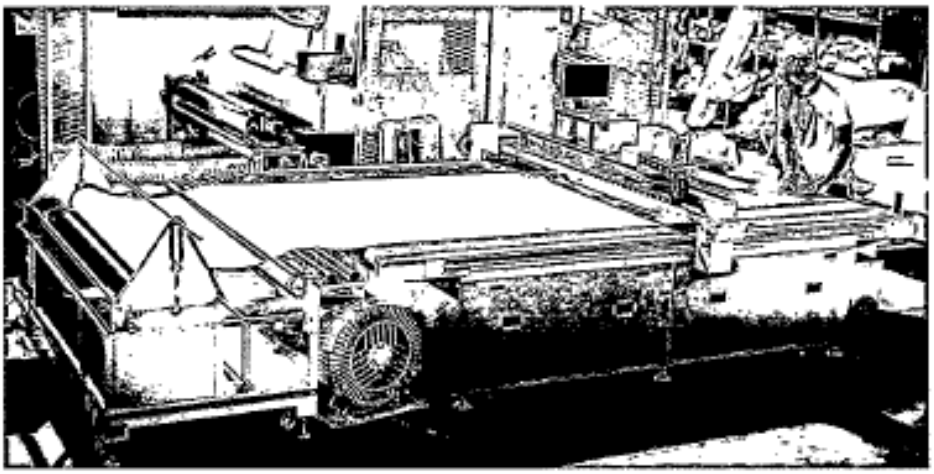
A thermoplastic water tank is shown below.

(e) Name an appropriate process to manufacture the thermoplastic water tank and state why it is suitable. 2

Process injection moulding

Suitable because the water tank is hollow on the inside.

**9.** Computer Aided Manufacture (CAM) is often used in the mass-manufacture of products.



(a) Explain the benefits of CAM to the manufacturer. 3

- reduces waste of materials as there is no human error
- no need to pay wages as machines do all the work so companies save many
- machines can run for 24/7

Not all products can be mass-manufactured.

(b) Explain why some products are not suitable for mass-manufacture. 1

- products that needed
- some products are made as one off products

**10.** Manufacturers often use standard components such as the part shown below.

Outline the benefits of using standard components to the manufacturer. 3

- can be mass manufactured
- come in set sizes
- can be used in design of products

11. Manufacturers have a responsibility to reduce landfill waste by extending product life expectancy.

Outline **three** steps that manufacturers could take to extend the life expectancy of a product. 3

-using durable materials

~~making repair~~

~~making~~

- making products easy to repair

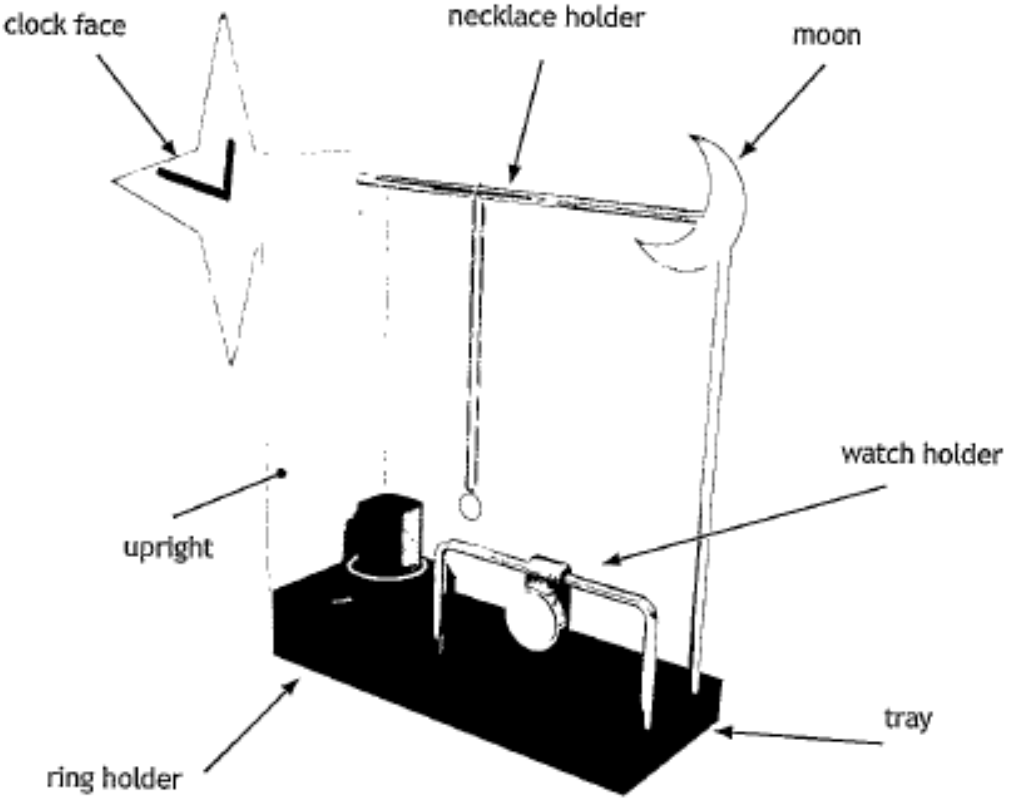
~~by selling spare parts~~

~~make products easy to clean~~

-making replacement parts available to customers.

## Candidate 5 evidence

1. A design proposal for a jewellery organiser is shown below.




(a) The ring holder and tray were manufactured from a stained softwood.

(i) Name a suitable softwood for the ring holder and tray. 1

Scotts Pine

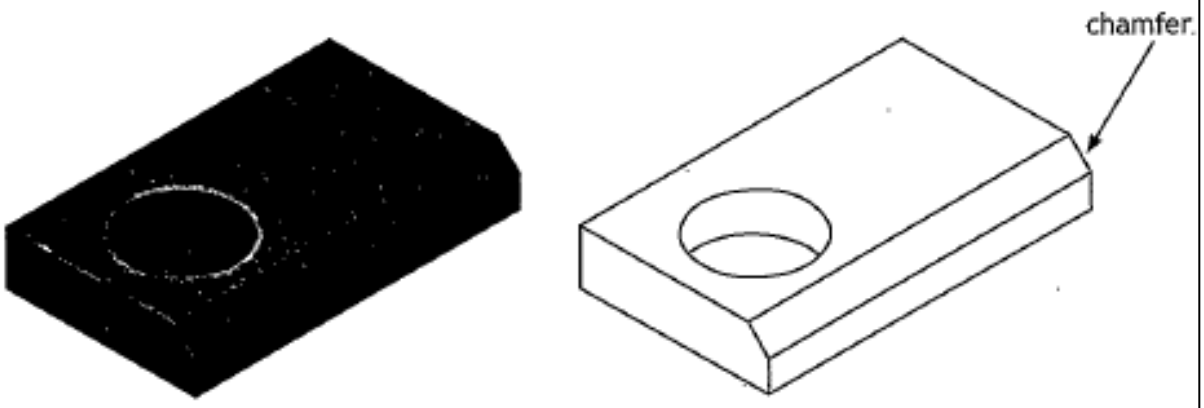
A flat-bottomed hole was drilled into the ring holder to store rings.

(ii) Name the suitable drill bit that could be used to drill a flat-bottomed hole. 1

Forstner Bit

1. (continued)

The edge of the ring holder was chamfered.

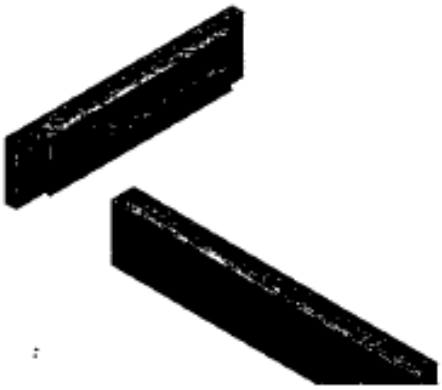



(iii) Name the suitable hand tool that could be used to create the chamfer. 1

Jack Plane

1. **(continued)**

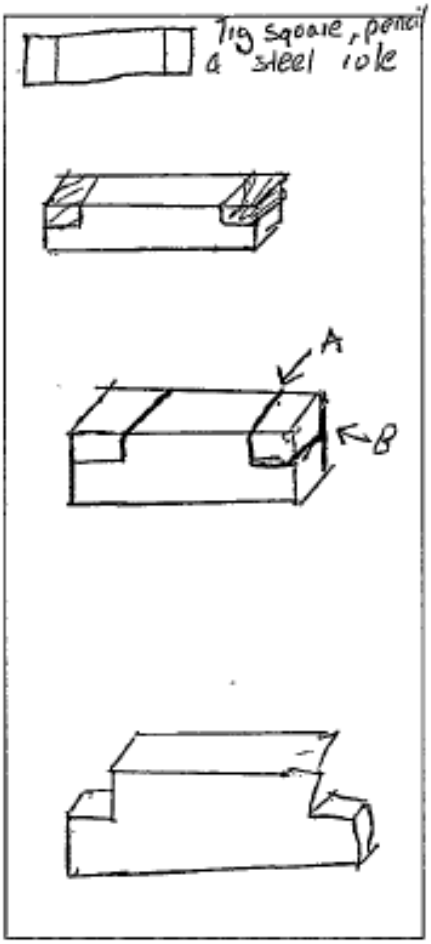
(b) The tray was manufactured using a corner rebate joint.



(i) Describe how the corner rebate joint could be marked **and** cut out accurately. You must refer to workshop tools in your answer. 4

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

1) Start off by measuring in the legnth of the wood.
2) Mark half the thickness of the wood using a try square.
3) Saw down on the inside of the A lines using a tenon saw.
4) Then place the wood sideways in a vice and cut along the B lines in the centre.
5) Remove waste with chisel & finish off with hand router



1. (b) (continued)

(ii) Name another suitable joint that could be used for the corners of the tray. 1

Finger Joint

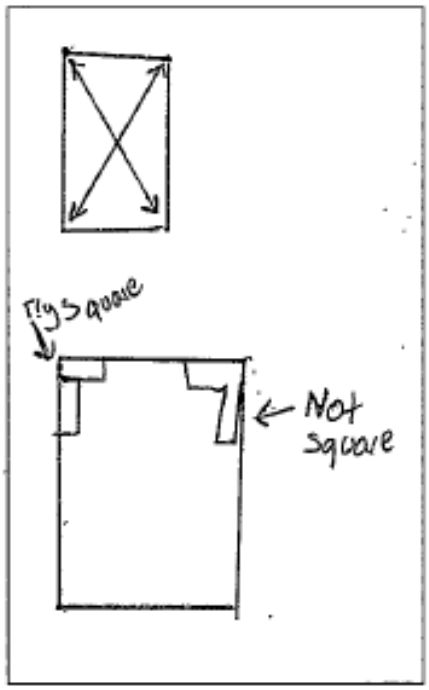
The tray was checked for squareness during assembly.

(iii) Outline **two** methods of checking the frame is square. 2

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

1) Measure corner to corner and if the lengths are the same it is square.

2) Place a try square in the corner of the joints and if there is a gap it is not square




The softwood tray was assembled using an adhesive.

(iv) Name the appropriate adhesive for assembling the softwood tray. 1

PVA glue

[Turn over

1. (b) (continued)

All wooden components were prepared for a stained finish.

(v) Describe **three** stages in the preparation of the wooden components before applying stain. 3

1) Sand down course grit first to remove pencil marks. Then work your way down to a fine grit to smoothen it out. Apply stain evenly. Allow it to properly soak into the wood.

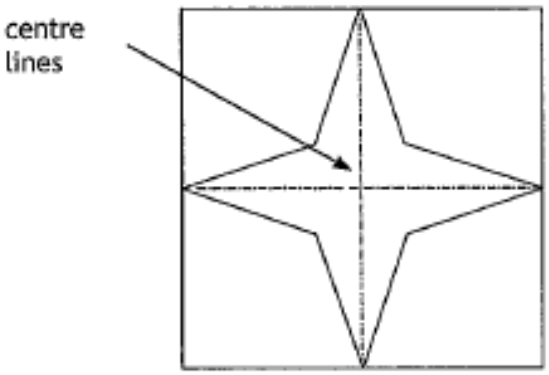
(c) The clock face was made from brass.

(i) State **two** reasons why brass is a suitable material for the clock face. 2

- Reasonable stregnth
- Easy to work with

1. (c) (continued)

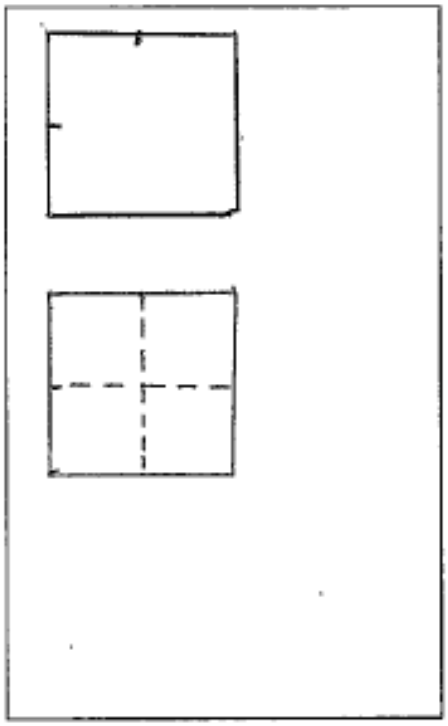
The brass clock face was marked out as shown below.




(ii) Describe how to mark out the centre lines of the clock face, with reference to workshop tools. 2

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

Measure into the Negative middle of the square with a steel rule & scribe. Extend the line down with an engineers square



A hand tool was used to cut out the star shape.

(iii) Name an appropriate hand tool that could be used to cut out the star. 1

Coping Saw Junior Hack Saw

1. **(continued)**

(d) The ends of the necklace hanger were turned on a centre lathe as shown below.

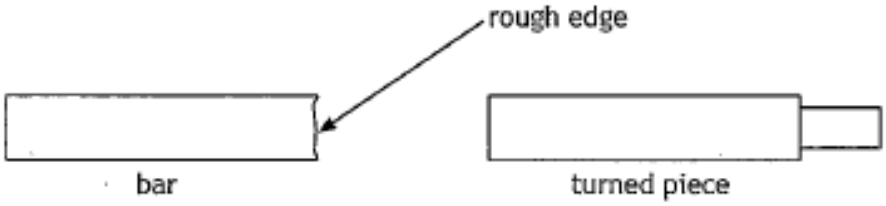
(i) Outline **two** safety checks that must be carried out on the centre lathe **before** turning. 2

'Ensure the piece is secure in the 3 Jaw chuck.

The saftey gaurd is down

1. (d) (continued)

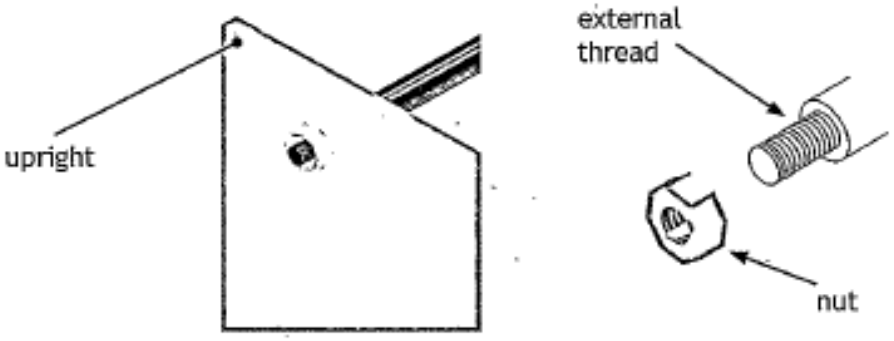
The bar was supplied as shown below.




(ii) Name two processes that would be carried out on the centre lathe to create the turned piece. 2

- Facing off
- Parallell turning

An external thread was cut on the end of the bar to allow it to be attached to the upright using a nut.

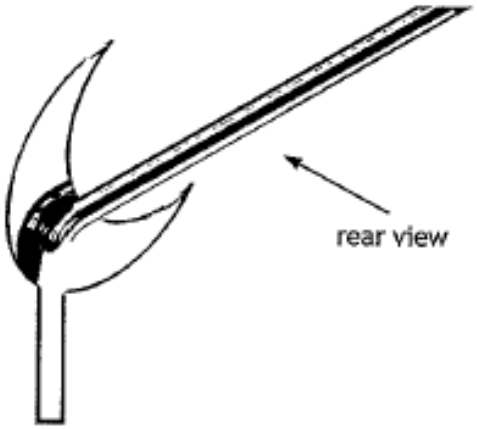



(iii) Describe two ways of ensuring a good quality thread is cut. 2

- Apply a small amount of tapping paste to the bar and die
- Turn the die a bench half way round then quater turn back to free up any metal shavings.

1. (d) (continued)

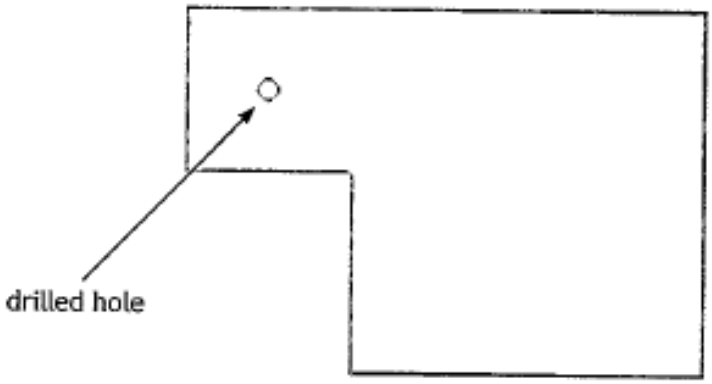
The brass moon was permanently joined to the brass bar.




(iv) Name a suitable adhesive for permanently joining the moon to the bar. 1

Epoxy Resin Soldering

(e) A hole was drilled in the acrylic upright to allow the clock mechanism to be held.

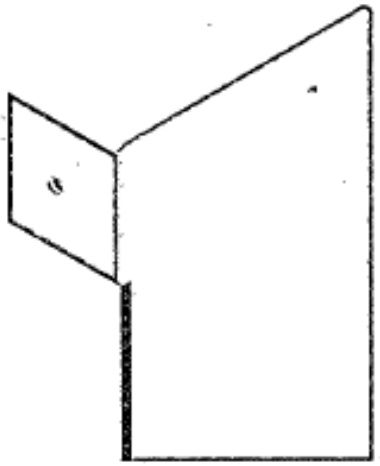



(i) Outline one method of preventing the acrylic cracking during drilling. 1

Drill a smaller piolet hole in place of the hole then drill through it.

1. (e) (continued)

The upright was bent to a right angle as shown below.



(ii) Describe how the right-angled bend could be formed accurately, with reference to workshop tools. 2

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

- Heat up the area which is being formed.
- Put the acrylic in the former and wait for it to cool down and take shape.

(iii) Explain why the hole was drilled in the upright before the bend was formed. 1

The plastic may be more fragile after being formed

MARK

2. When carrying out research, a variety of methods can be used to gather information.

(a) Explain the benefits of using a questionnaire to gather information. 3

1. A questionaire allows the manufacturer to know what features people are looking out for.
2. What the product will needs and what people desire
3. To find out the target market of the product

After completing the research, a product specification can be produced.

(b) Describe how a specification can be used during the design process. 1

To show the functions, materials and aesthetics of the product.

3. Brainstorming can be used as an idea generation technique.

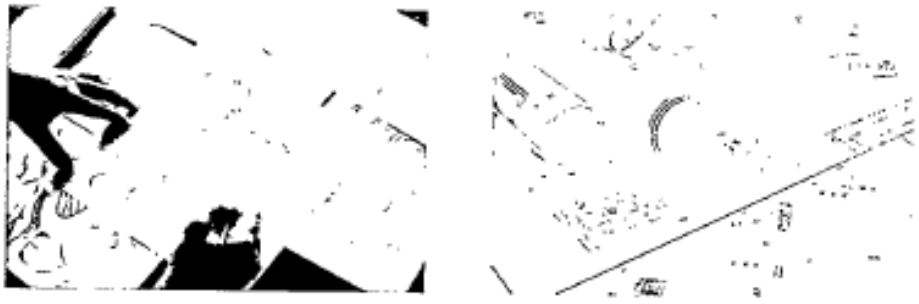
(a) Describe the key stages of brainstorming. 3

- Brainstorming can be done individually or in a group.
- Gather up all of the factors involved in making it.
- Expanding all the factors e.g chair; 4 legs, 3 legs or one leg.

(b) Name another idea generation technique. 1

Morpholgdcal analysis

4. Designers use graphic techniques at different stages of the design process.



(a) Outline **two** reasons why sketching is a suitable graphic technique to use when generating ideas. 2

- It can show possible ideas of what the model can look like.
- Is easy to adapt the designs and how it looks.

(b) Outline **two** reasons why a designer will produce working drawings during the planning for manufacture stage. 2

- So the manufacturers can adjust the sizes and dimentions if needed.
- To refer to them when its being manufactured.

4. (continued)

During the design process designers can use computer generated and physical models.

(c) Explain the benefits of using physical models such as sketch, scale or block models during the design process. 3

1. To understand how the product should look.
2. To be able to see where mistakes are and how to improve on them.
3.

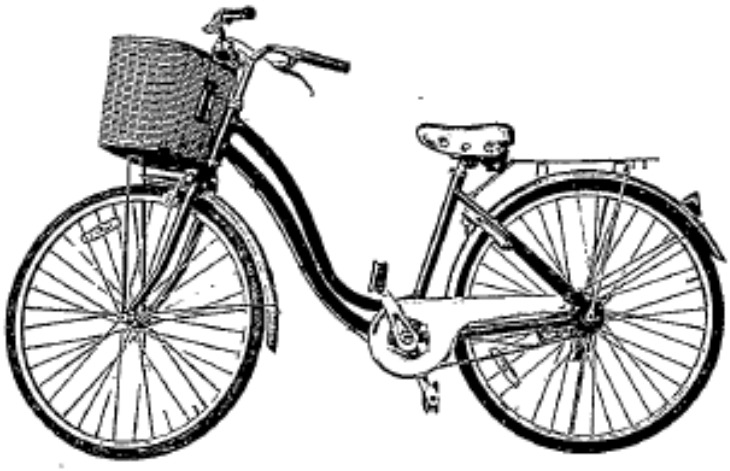
[Turn over

5. A kettle is shown below.

Describe how ergonomics may have influenced the design of the kettle. 4

- The shape of the handle, how long and thick the handle is.
- The handle needs to be a shape which fits most users hands.
- The button to open the top needs to be easy to access while holding the kettle.
- The kettle needs to be a comfortable weight and height for all users.
- The handle needs to have grip so it is easy to carry.

6. A bicycle is shown below.



*You must give different examples for (a) and (b).*

Describe how the following design factors may have influenced the design of the bicycle:

(a) safety. 3

- The bikes breaks must be easy to reach incase of an emergency stops.
- Mud guard must not be touching the wheel to prevent it from getting caught.
- Reflectors and lights so the bike is visible in the dark.

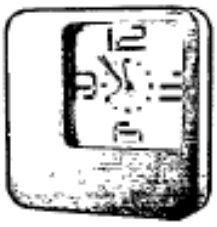
(b) function. 3

- The basket on the front to allow for storage.
- Railings on the back to allow for extra storage
- The peddles must work to allow the bike to move.

**7.** Three clocks are shown below.

Clock A

Clock B



Clock C

(a) Describe how the clocks **compare** aesthetically. **3**

*You should compare three different aesthetic aspects.*

Clock A - is black bold text which is easy to read. Turquoise colour helps it ~~Blackpool~~ stand out.

Clock B - is wooden and a more classical / vintage design with roman numerals.

Clock C - is bright Pink big numbers which stand out although a smaller face!

7. **(continued)**

Brand image is important to many companies.

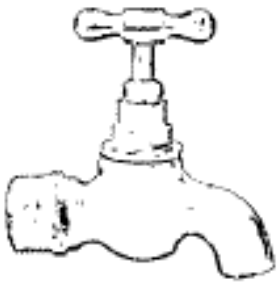
(b) Describe **two** benefits of a strong brand image. 2

- It makes the product more desireble and sought after.
- If the product is high quality people will continue to bygy from it.

[Turn over

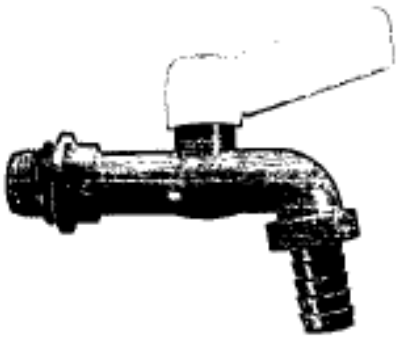
8. Two mass manufactured taps are shown below.

Metal Tap



Metals
- Mild steel
- Copper
- Iron

Plastic Tap



Plastics
- Acrylic
- Urea formaldehyde
- ABS

*A different reason must be given for the suitability of each material.*

(a) A metal tap is shown above.

(i) Name the most suitable metal from the list provided. 1

Mild steel

(ii) State why the metal you have selected would be suitable for the tap. 1

will not rust if it is outside

(b) A plastic tap is shown above.

(i) Name the most suitable plastic from the list provided. 1

~~Acrylic~~ Urea formaldhyde

(ii) State why the plastic you have selected would be suitable for the tap. 1

can be injected moulded into the shape.

8. (continued)

Mass manufacturing processes were used to produce the taps.

*You must give different responses in (c) and (d).*

(c) State **two** identifying features that would show the plastic tap was injection moulded. 2

1) Split lines show that it has been in a two part mould.

2) Ejection points show where the plastic has been injected into with the needle

(d) Outline **two** reasons why die casting is a suitable process for mass manufacturing the metal taps. 2

- The moulds can be re-used over and over

- It gives a no similar product each time instead of different quality.

[Turn over

8. (continued)

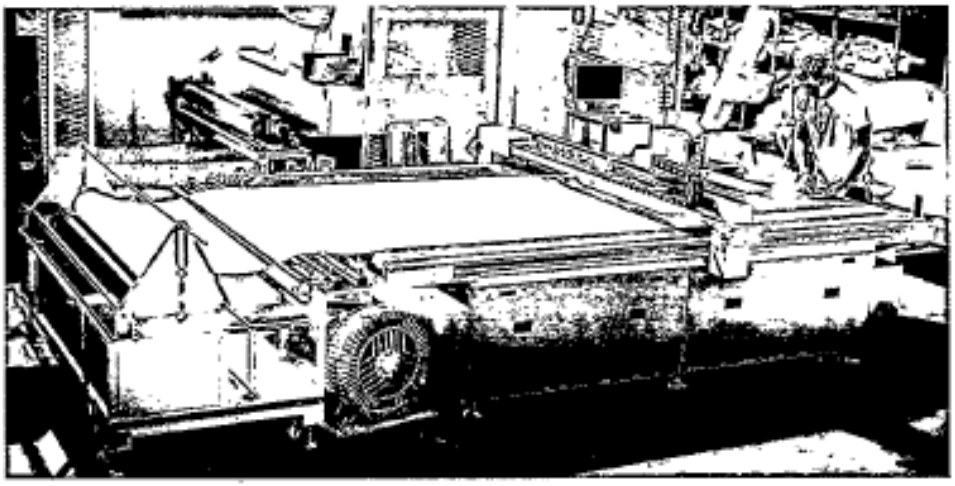
A thermoplastic water tank is shown below.

(e) Name an appropriate process to manufacture the thermoplastic water tank and state why it is suitable. 2

Process Injection moulding

Suitable because it can be mass manufactured easily. Can do more detailed pieces

9. Computer Aided Manufacture (CAM) is often used in the mass-manufacture of products.



(a) Explain the benefits of CAM to the manufacturer. 3

- It can run 24/7 without very much human assistance.
- No human error as it is all done by computers.
- Not as much stressful manual labour.

Not all products can be mass-manufactured.

(b) Explain why some products are not suitable for mass-manufacture. 1

More intricate designes take more precission and have to be taken slowly.

**10.** Manufacturers often use standard components such as the part shown below.

Outline the benefits of using standard components to the manufacturer. 3

- Cheap to buy in large numbers
- comes in a range of different sizes.
- Are easy to ~~use~~ apply in the product

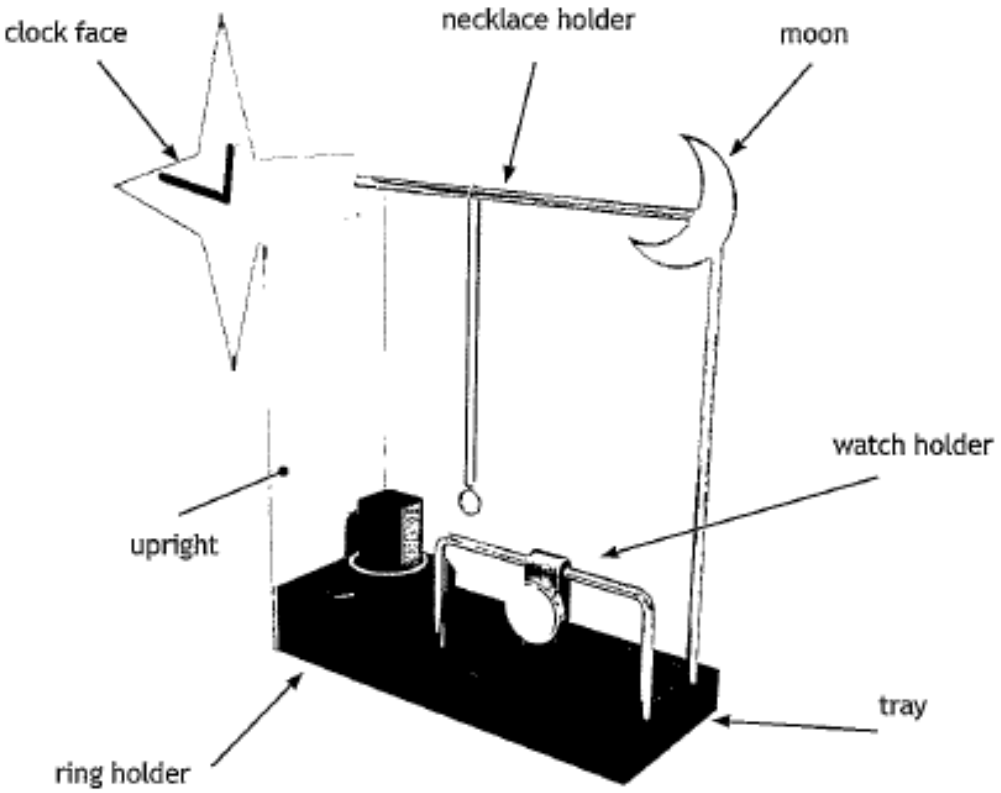
**11.** Manufacturers have a responsibility to reduce landfill waste by extending product life expectancy.

Outline **three** steps that manufacturers could take to extend the life expectancy of a product. **3**

- Make the products out of more durable materials,
- Easy to repair if they are broken instead of binning them,
- Use finishes which protect them from damages.

# Candidate 6 evidence

1. A design proposal for a jewellery organiser is shown below.




(a) The ring holder and tray were manufactured from a stained softwood.

(i) Name a suitable softwood for the ring holder and tray. 1

Cedar.

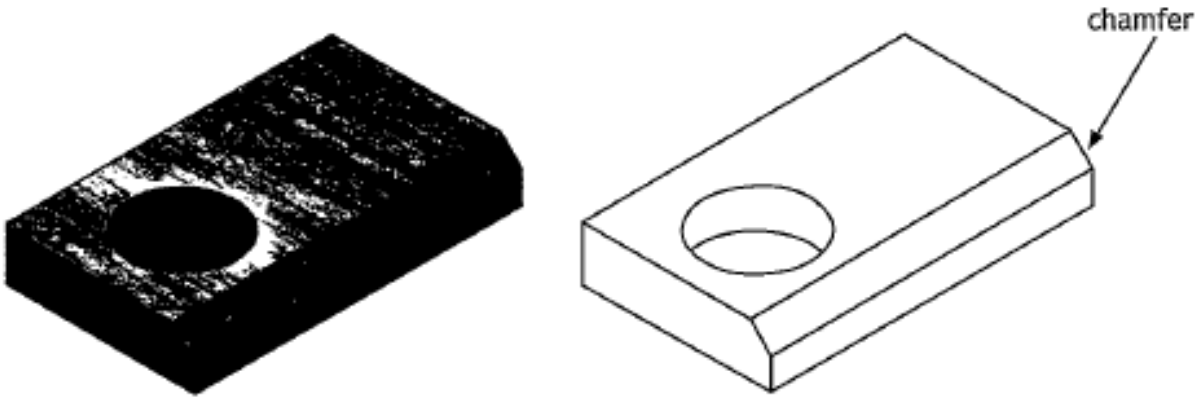
A flat-bottomed hole was drilled into the ring holder to store rings.

(ii) Name the suitable drill bit that could be used to drill a flat-bottomed hole. 1

Fostner bit.

**1. (continued)**

The edge of the ring holder was chamfered.




(iii) Name the suitable hand tool that could be used to create the chamfer. 1

Coping Saw.

1. **(continued)**

(b) The tray was manufactured using a corner rebate joint.

(i) Describe how the corner rebate joint could be marked and cut out accurately. You must refer to workshop tools in your answer. 4

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

I'd use a steel rule to measure the correct size of the bit of wood getting connected to it. Use a Try square to help draw a 90° angle onto the wood using a pencil. Use a tenon saw to cut down to the line drawn out and use a chisel to remove the material. Use sandpaper to sand it down to accurate depth.

1. (b) (continued)

(ii) Name another suitable joint that could be used for the corners of the tray. 1

Finger joint.

The tray was checked for squareness during assembly.

(iii) Outline two methods of checking the frame is square. 2

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

- put a level on it to see if it is square and straight.
- check if the box is at a 90° angle.
- measure the frame.

The softwood tray was assembled using an adhesive.

(iv) Name the appropriate adhesive for assembling the softwood tray. 1

PVA glue.

[Turn over

1. (b) (continued)

All wooden components were prepared for a stained finish.

(v) Describe three stages in the preparation of the wooden components before applying stain. 3

- Make sure the wood is sanded down so there is no sharp edges or bumps.
- Make sure the wood is completely done and there is nothing else you need to do before applying stain.
- Apply a varnish first to the wood to make is easier to apply stain.

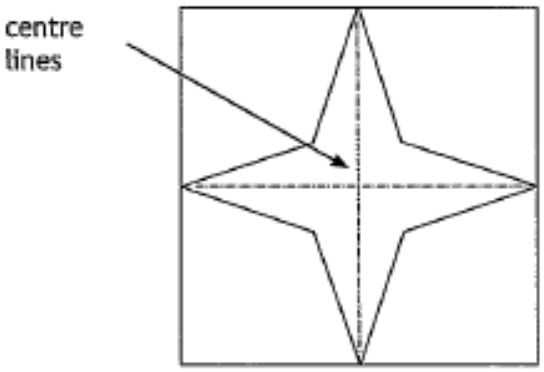
(c) The clock face was made from brass.

(i) State two reasons why brass is a suitable material for the clock face. 2

- Brass is very strong
- Brass is durable.
- Brass is easy to work with.

**1. (c) (continued)**

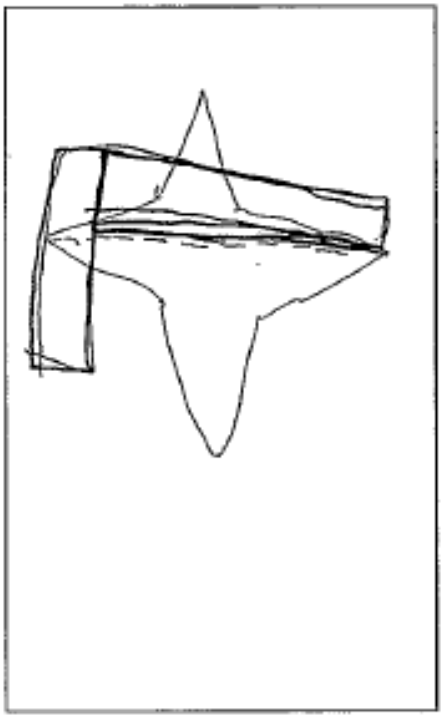
The brass clock face was marked out as shown below.




(ii) Describe how to mark out the centre lines of the clock face, with reference to workshop tools. 2

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

Uses a toy square to mark parallel lines. Measure with a toy square to ensure it is exactly in the middle. Use a pencil to draw the lines onto the wood



A hand tool was used to cut out the star shape.

(iii) Name an appropriate hand tool that could be used to cut out the star. 1

Tenon Saw

**1. (continued)**

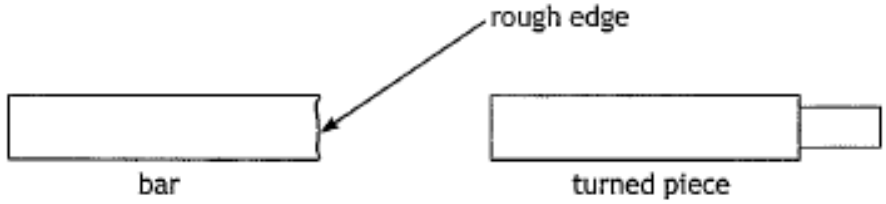
(d) The ends of the necklace hanger were turned on a centre lathe as shown below.

(i) Outline two safety checks that must be carried out on the centre lathe **before** turning. **2**

- Make sure that the guard is down before using centre lathe.
- Make sure that the chuck key has been removed before starting.

1. (d) (continued)

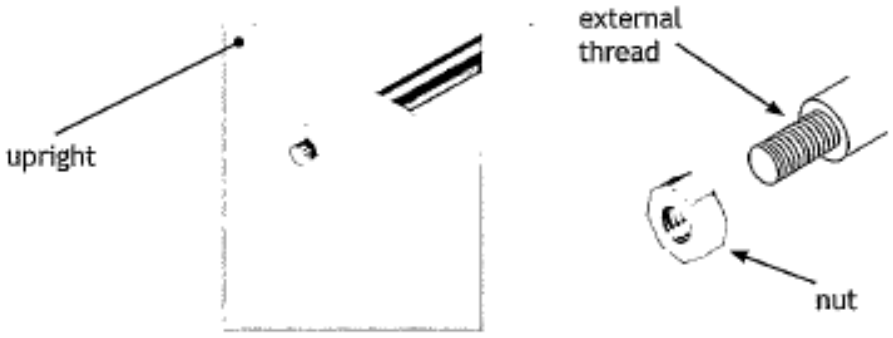
The bar was supplied as shown below.




(ii) Name **two** processes that would be carried out on the centre lathe to create the turned piece. 2

- parallel turning.
- chamfering.

An external thread was cut on the end of the bar to allow it to be attached to the upright using a nut.

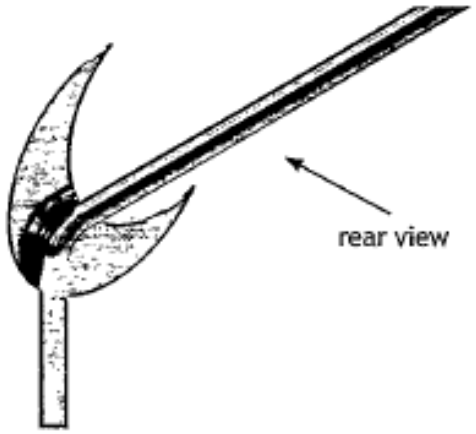



(iii) Describe **two** ways of ensuring a good quality thread is cut. 2

- Make sure that the external thread is the same width as the nut. This makes it good quality.
- Make sure it is not too long or too short for it to be attached to the upright.

1. (d) (continued)

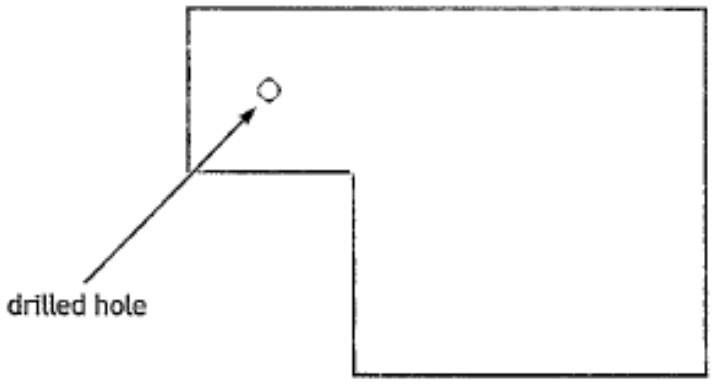
The brass moon was permanently joined to the brass bar.




(iv) Name a suitable adhesive for permanently joining the moon to the bar. 1

- Epoxy Resin.
- PVA Glue.

(e) A hole was drilled in the acrylic upright to allow the clock mechanism to be held.



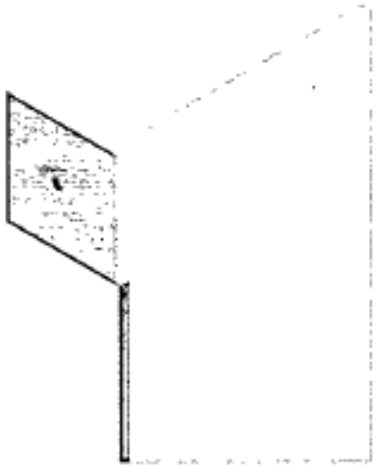

(i) Outline **one** method of preventing the acrylic cracking during drilling. 1

Drill slowly to stop the plastic from cracking because of the pressure.

MARKS

1. (e) (continued)

The upright was bent to a right angle as shown below.



(ii) Describe how the right-angled bend could be formed accurately, with reference to workshop tools. 2

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

Use a former to help make it correct angle. Attach plastic into bench vice to keep in place and Use a hammer/ mallet to hit it until it forms the shape of former.

(iii) Explain why the hole was drilled in the upright before the bend was formed. 1

It is easier to drill a hole into a flat piece of plastic, rather than one bent at a right angle.

2. When carrying out research, a variety of methods can be used to gather information.

(a) Explain the benefits of using a questionnaire to gather information. 3

- You can reach a large audience with a questionnaire, meaning that you'll get more responses.
- You can give questionnaires to ~~specific~~ specific target market this means you're not wasting time with people who aren't interested.
- It is easy and cheap to set up a questionnaire and easy to give them out too.

After completing the research, a product specification can be produced.

(b) Describe how a specification can be used during the design process. 1

- You are able to see what products people would like to see and you can make them. This means that you are pleasing the public and more people will buy the product then.

**3.** Brainstorming can be used as an idea generation technique.

(a) Describe the key stages of brainstorming. 3

- A group of people come up with different ideas.
- Someone keeps a record of all ideas people say.
- No idea is silly or bad.
- Everybody can spark ideas off each other which creates more ideas.

(b) Name another idea generation technique. 1

Morphological analysis.

4. Designers use graphic techniques at different stages of the design process.

(a) Outline **two** reasons why sketching is a suitable graphic technique to use when generating ideas. 2

- You can easily fix mistakes you make
- Easy to make a rough, quick sketch.

(b) Outline **two** reasons why a designer will produce working drawings during the planning for manufacture stage. 2

- To shows to the public so that they can see what it will look like.
- ~~To make it easier for the~~ So that you can see the sizes and how it will look/work.

**4. (continued)**

During the design process designers can use computer generated and physical models.

(c) Explain the benefits of using physical models such as sketch, scale or block models during the design process. 3

- Using physical models allows you to see how it will look.
- It also lets you see if products will fit and work in the model.
- Using physical models lets you see if there is any changes that need to be made.
- You can make them to scale, which means you can decide if you need to adjust the sizes on it.

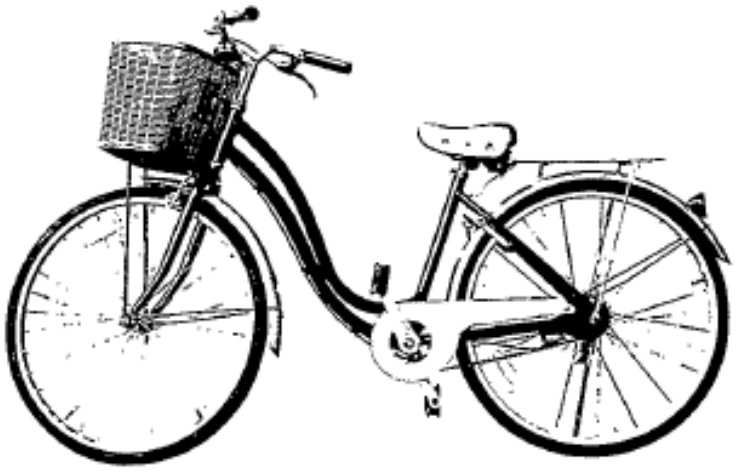
[Turn over

**5.** A kettle is shown below.

Describe how ergonomics may have influenced the design of the kettle. **4**

- The handle is big enough to fit any size of hand, allowing anyone to use it.
- It doesn't require too much strength stopping people being hurt/injured.
- It is very straight forward to use and is not confusing to people.
- The button on the handle is close by, meaning that you can press it while holding it.
- If the button is not too hard to press down on.

6. A bicycle is shown below.



*You must give different examples for (a) and (b).*

Describe how the following design factors may have influenced the design of the bicycle:

(a) safety. 3

- They There is handles in front of you which allows you to hold onto so that you dont fall.
- There is breaks on handles which will stop you from bumping into things and lets you slow down to stop from injuring yourself or others.
- Your feet are not near the wheel which means ~~it~~ you cant get your feet stuck in wires. -3

(b) function.

- The basket on the front allows you to take things with you while riding the bike.
- The pedals on the bike is what helps the bike to move at whatever speed you want.
- The wheels are round which helps the bike to more without getting stuck on things.

7. Three clocks are shown below.

Clock A

Clock B

Clock C

(a) Describe how the clocks **compare** aesthetically. 3

*You should compare **three** different aesthetic aspects.*

- clock A and C both have numbers on the clock whereas clock B has roman numerals.
- Clock B is a very old looking clock whereas the others ones are more modern.
- Clock C is squaure whereas clock A is round.
- Clock A and C have brighter colours whereas clock B has a brown colour.

**7. (continued)**

Brand image is important to many companies.

(b) Describe **two** benefits of a strong brand image. 2

- Having a strong brange image means that people are more likely to buy ~~buy~~ new products you release
- Having strong brand image it also allows you to place the price higher on products as people will still buy.

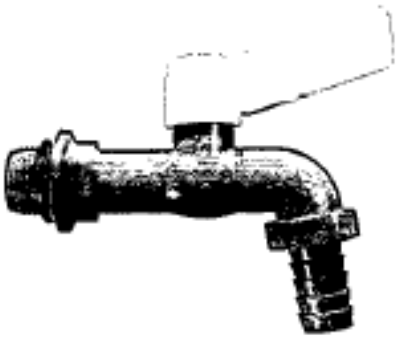
[Turn over

**8.** Two mass manufactured taps are shown below.

Metal Tap

Metals
- Mild steel
- Copper
- Iron

Plastic Tap



Plastics
- Acrylic
- Urea formaldehyde
- ABS

*A different reason must be given for the suitability of each material.*

(a) A metal tap is shown above.

(i) Name the most suitable metal from the list provided. **1**

Mild ~~Stat~~ steel

(ii) State why the metal you have selected would be suitable for the tap. **1**

because it is strong and durable.

(b) A plastic tap is shown above.

(i) Name the most suitable plastic from the list provided. **1**

Urea formaldehyde

(ii) State why the plastic you have selected would be suitable for the tap. **1**

because it doesn't soften when heated up.

8. (continued)

Mass manufacturing processes were used to produce the taps.

*You must give different responses in (c) and (d).*

(c) State **two** identifying features that would show the plastic tap was injection moulded. 2

- It is perfectly round shape.
- It is correct size
- Hollow.

(d) Outline **two** reasons why die casting is a suitable process for mass manufacturing the metal taps. 2

- It allows you to have a nice texture on all of the taps
- It is easy and cheap to do
- Dies casting is quick and has a good finish.
- It is very accurate.

[Turn over

**8. (continued)**

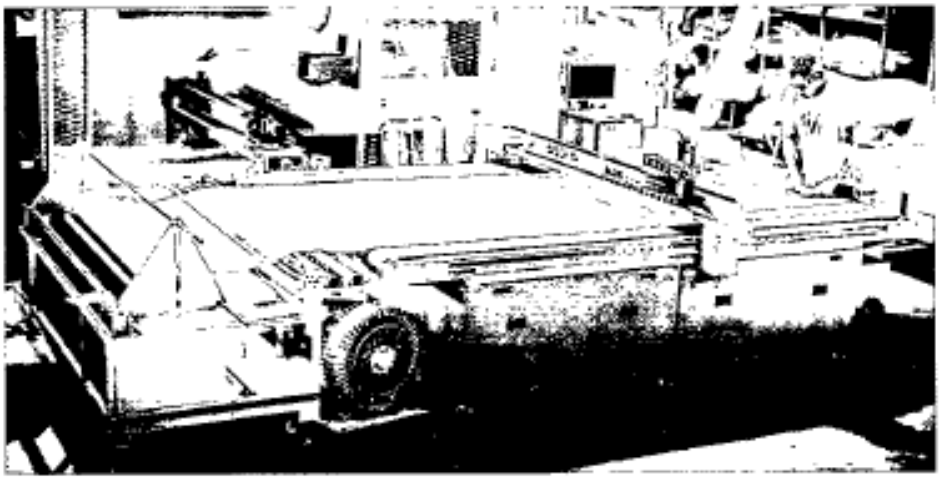
A thermoplastic water tank is shown below.

(e) Name an appropriate process to manufacture the thermoplastic water tank and state why it is suitable. 2

Process Vacuum forming

Suitable because it creates a good shape. It works well to create the water tank.

9. Computer Aided Manufacture (CAM) is often used in the mass-manufacture of products.



(a) Explain the benefits of CAM to the manufacturer. 3

- It is highly accurate in creating good products.
- Less room for human error because it is a computer creating it.
- All products will turn out exactly the same as a machine makes everything identically.
- Very quick and takes less time than humans do.

Not all products can be mass-manufactured.

(b) Explain why some products are not suitable for mass-manufacture. 1

If some products dont need to be made many times therefore it would not be necessary to create so many products if you only need a few.

**10.** Manufacturers often use standard components such as the part shown below.

Outline the benefits of using standard components to the manufacturer. 3

- You can use them on different products.
- You get to skip a stage in the production process.
- ~~Make~~ You can create products faster.
- You can make more products.
- ~~Creates a standard brand image~~

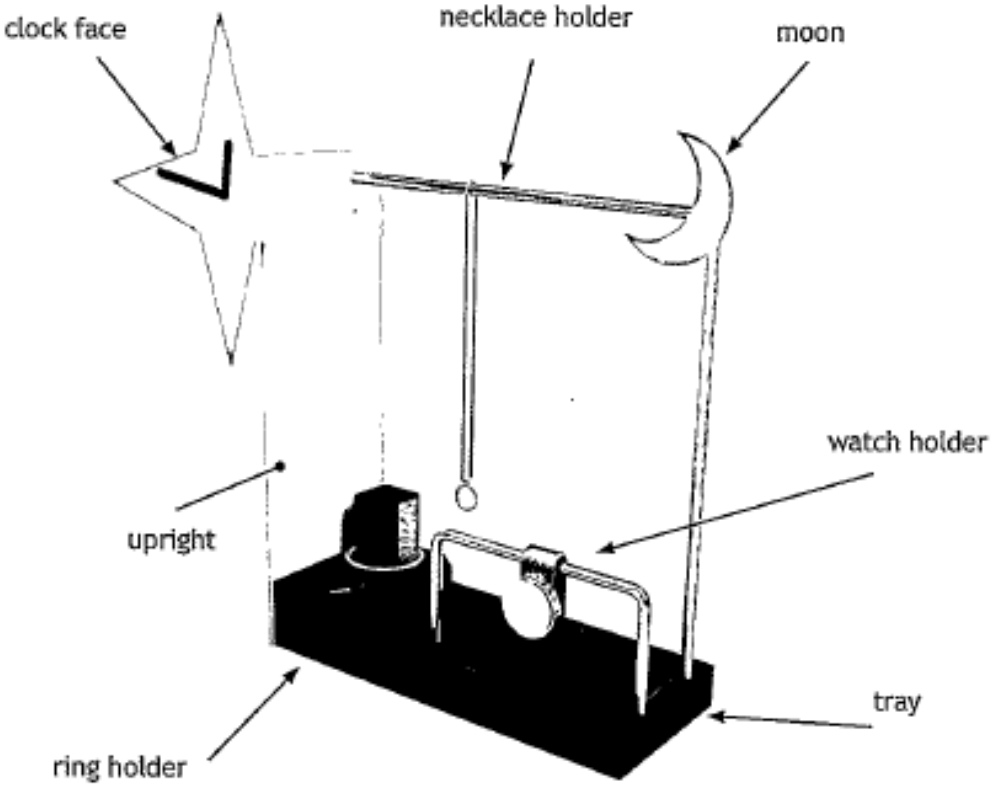
11. Manufacturers have a responsibility to reduce landfill waste by extending product life expectancy.

Outline **three** steps that manufacturers could take to extend the life expectancy of a product. 3

- You could recycle materials instead of throwing them away.
- Reduce the amount of harmful materials being used in the products.
- Try to fix products once they are broken.
- Use the product lifecycle.

## Candidate 7 evidence

1. A design proposal for a jewellery organiser is shown below.




(a) The ring holder and tray were manufactured from a stained softwood.

(i) Name a suitable softwood for the ring holder and tray. 1

White Pine

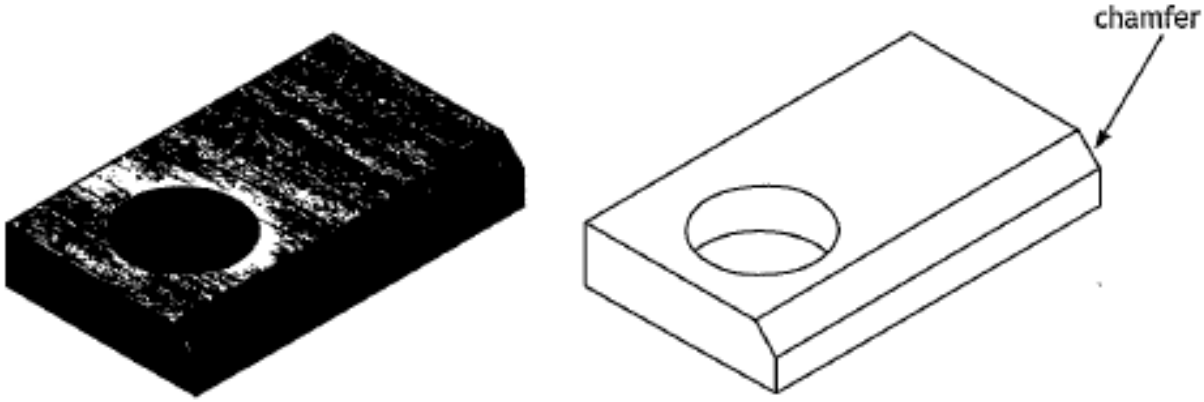
A flat-bottomed hole was drilled into the ring holder to store rings.

(ii) Name the suitable drill bit that could be used to drill a flat-bottomed hole. 1

12mm drill piece

1. (continued)

The edge of the ring holder was chamfered.




(iii) Name the suitable hand tool that could be used to create the chamfer. 1

Grannys tooth

**1. (continued)**

(b) The tray was manufactured using a corner rebate joint.

(i) Describe how the corner rebate joint could be marked and cut out accurately. You must refer to workshop tools in your answer. 4

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

It could be marked out using a steel rule and pencle, You should then use a tennon saw to cut down to the marked out line, any excess wood should then be chizled by useing a halsway chizel.

1. (b) (continued)

(ii) Name another suitable joint that could be used for the corners of the tray. 1

Finger Joints

The tray was checked for squareness during assembly.

(iii) Outline two methods of checking the frame is square. 2

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

One method you could use is using a try Square and Checking all Corners as the Srame are at a 90° angel. You Could also Check by lining the corner up With the side as a flat desk.

The softwood tray was assembled using an adhesive.

(iv) Name the appropriate adhesive for assembling the softwood tray. 1

PVa Glue

[Turn over

1. (b) (continued)

All wooden components were prepared for a stained finish.

(v) Describe three stages in the preparation of the wooden components before applying stain. 3

Making sure any chips in the wood were removed.
Making sure the wood is flat and does not have bumps indented.
Make sure all gaps are filled.

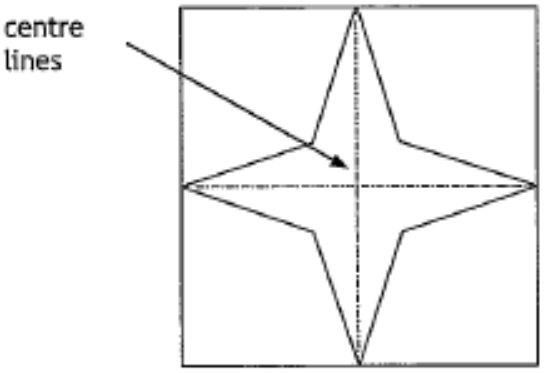
(c) The clock face was made from brass.

(i) State two reasons why brass is a suitable material for the clock face. 2

~~It is a light metal~~ It has holes sor the clock legs to go and can also sit the numbers on.

1. (c) (continued)

The brass clock face was marked out as shown below.




(ii) Describe how to mark out the centre lines of the clock face, with reference to workshop tools. 2

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

You could use a compass to show exactly where the middle is. you could also use a steel file and try square to make a cross.

A hand tool was used to cut out the star shape.

(iii) Name an appropriate hand tool that could be used to cut out the star. 1

Hack saw

1. **(continued)**

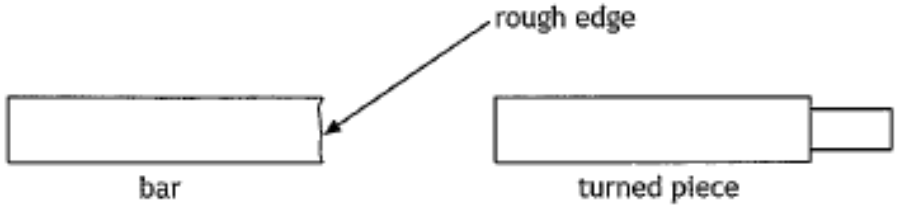
(d) The ends of the necklace hanger were turned on a centre lathe as shown below.

(i) Outline **two** safety checks that must be carried out on the centre lathe **before** turning. 2

That the handles can be easily reached in emergancys and you also use safty goggles to prevent any metal that could get ~~lose~~ loose from the machie getting into your eyes.

**1. (d) (continued)**

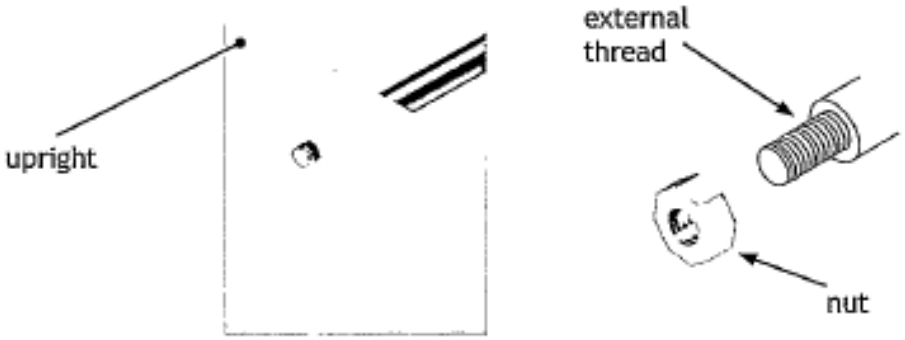
The bar was supplied as shown below.




(ii) Name **two** processes that would be carried out on the centre lathe to create the turned piece. 2

lathe rounding and catagory lathe'ing.

An external thread was cut on the end of the bar to allow it to be attached to the upright using a nut.

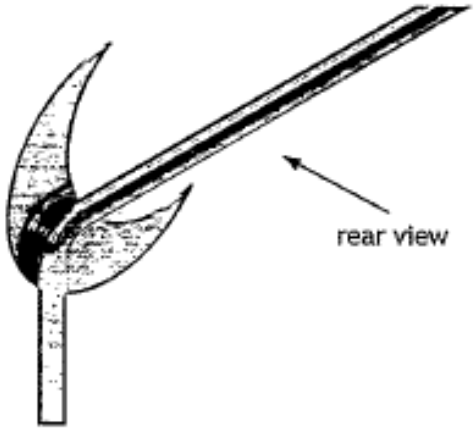



(iii) Describe **two** ways of ensuring a good quality thread is cut. 2

That nut sits the external thread and does not come ~~lose~~ loose, causing the product to sall apart.

1. (d) (continued)

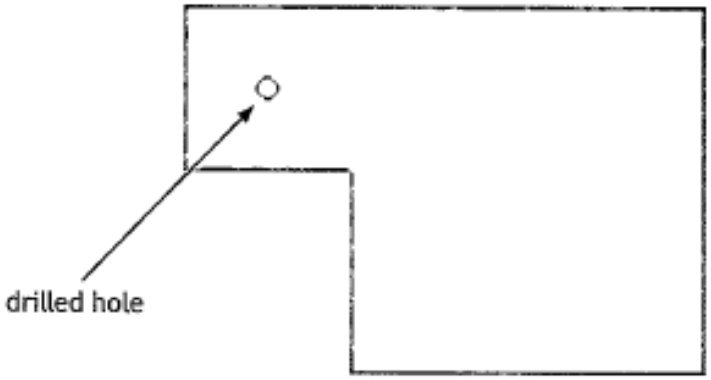
The brass moon was permanently joined to the brass bar.




(iv) Name a suitable adhesive for permanently joining the moon to the bar. 1

Have a hook that can be hooked onto the bar.

(e) A hole was drilled in the acrylic upright to allow the clock mechanism to be held.

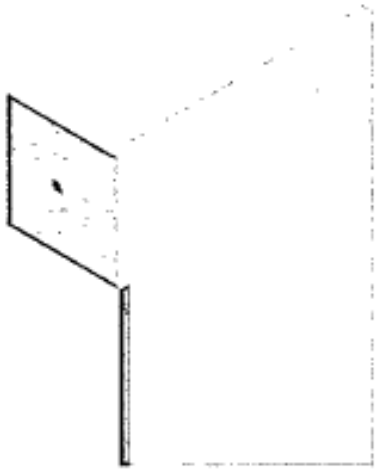



(i) Outline one method of preventing the acrylic cracking during drilling. 1

have it sat on a flat stable surface.

1. (e) (continued)

The upright was bent to a right angle as shown below.



(ii) Describe how the right-angled bend could be formed accurately, with reference to workshop tools. 2

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

It Could be formed using a theromating machine to heat plasic up, you shoulo the bend the plastic over something that has a right angled edge, like a table.

(iii) Explain why the hole was drilled in the upright before the bend was formed. 1

It Would have been much harder to drill and could lead to the plastic cracking.

2. When carrying out research, a variety of methods can be used to gather information.

(a) Explain the benefits of using a questionnaire to gather information. 3

You can gather insormation os clients to allow the product to be improved, you can also ask quistions in the quistionaire about bits os the product you are not sure about to see is it needs improvment and you can also see what clients think about the quality.

After completing the research, a product specification can be produced.

(b) Describe how a specification can be used during the design process. 1

It can be used to give you and imaginable base os key things the product has to do to be suncitional.

3. Brainstorming can be used as an idea generation technique.

(a) Describe the key stages of brainstorming. 3

You are in a group were all ideas are considered, you then have a disscussion on the pros and cons os each product, It also allows the manusacture to hear disserent opinons on how the product should suntion.

(b) Name another idea generation technique. 1

Lateral thinking

4. Designers use graphic techniques at different stages of the design process.

(a) Outline **two** reasons why sketching is a suitable graphic technique to use when generating ideas. 2

It is a suitable graphic as it provides you with an image of what the product will look like, it also allows you to compare disserent ideas.

(b) Outline **two** reasons why a designer will produce working drawings during the planning for manufacture stage. 2

It allows the designer to hare a visual imagenation of how the product will work when it has been manusactored.

**4. (continued)**

During the design process designers can use computer generated and physical models.

(c) Explain the benefits of using physical models such as sketch, scale or block models during the design process. 3

They all allow the designer to see what the final manufactured model/product will look like, they all also give the manufacturer a image of how the product will work when complete and it can also help with the comparison of different products.

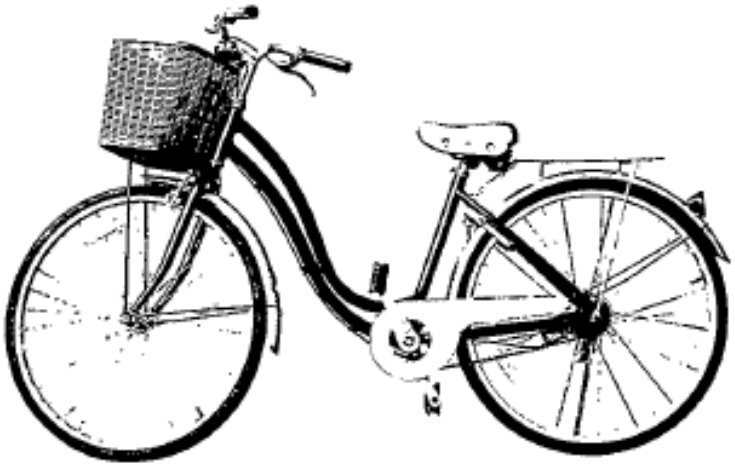
[Turn over

**5.** A kettle is shown below.

Describe how ergonomics may have influenced the design of the kettle. 4

Ergonomics would have insluenced this product because the products handle will provide a easy way sor the kettle to be moved, the lid would also have to sit persectly to prevent the spilage os hot water which could cause serious burns.

6. A bicycle is shown below.



*You must give different examples for (a) and (b).*

Describe how the following design factors may have influenced the design of the bicycle:

(a) safety. 3

The breaks would NEED to be working at all times to allow the custemer to slow down whenever they needed to.

(b) function. 3

That the wheels are able to work with the use of the chain and that the customer does not have any insuse wear they are not working.

7. Three clocks are shown below.

Clock A

Clock B

Clock C

(a) Describe how the clocks **compare** aesthetically. 3

*You should compare **three** different aesthetic aspects.*

Clock a is just your standard easy to use clock, Clock B Numbers are in roman Numerals Which could atract disserent customers, clock C provides bright colours which catch the eye os a younger generation. All 3 Clocks are manusactured sor disserent types os people it just depends What they like.

**7. (continued)**

Brand image is important to many companies.

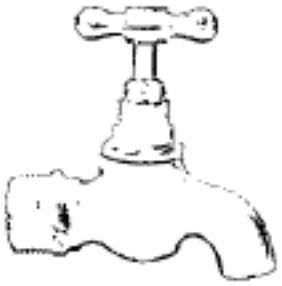
(b) Describe two benefits of a strong brand image. 2

It Will provide the product a better chance os getting bought and it also helps because there previous products were good it could persude customers to buy the prouct again.

[Turn over

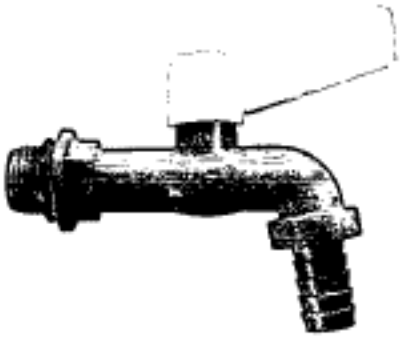
8. Two mass manufactured taps are shown below.

Metal Tap



Metals
- Mild steel
- Copper
- Iron

Plastic Tap



Plastics
- Acrylic
- Urea formaldehyde
- ABS

*A different reason must be given for the suitability of each material.*

(a) A metal tap is shown above.

(i) Name the most suitable metal from the list provided. 1

Iron

(ii) State why the metal you have selected would be suitable for the tap. 1

Thickness means it wont breaK

(b) A plastic tap is shown above.

(i) Name the most suitable plastic from the list provided. 1

Urea formadehyde

(ii) State why the plastic you have selected would be suitable for the tap. 1

Provides a stronger fondation

**8. (continued)**

Mass manufacturing processes were used to produce the taps.

*You must give different responses in (c) and (d).*

(c) State **two** identifying features that would show the plastic tap was injection moulded. **2**

You would not be able to bend the hoosle to that shape With the dents involved in it, the bend sorm the hoosle to the body os the tap could also not be shaped.

(d) Outline **two** reasons why die casting is a suitable process for mass manufacturing the metal taps. **2**

Makes it easier sor the metal to bend and also provides a thickness os material.

**[Turn over**

8. (continued)

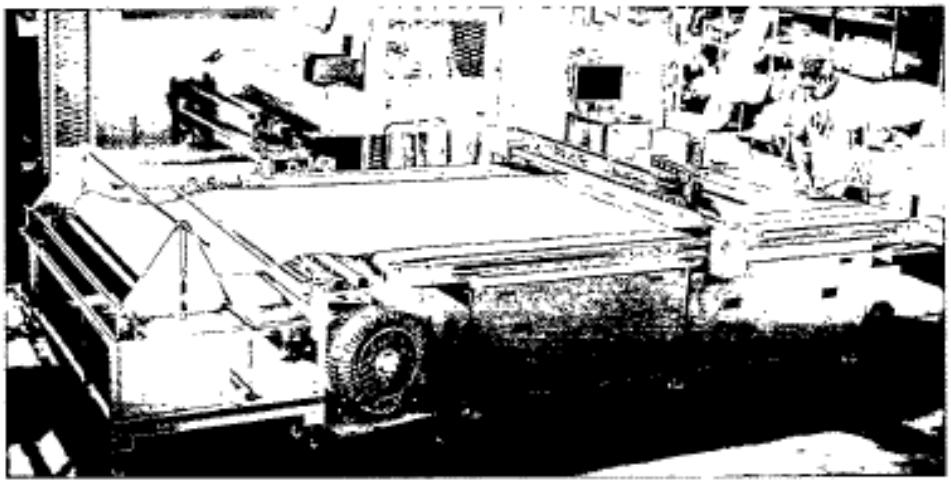
A thermoplastic water tank is shown below.

(e) Name an appropriate process to manufacture the thermoplastic water tank and state why it is suitable. 2

Process Welding

Suitable because It provide a suitable soundation.

9. Computer Aided Manufacture (CAM) is often used in the mass-manufacture of products.



(a) Explain the benefits of CAM to the manufacturer. 3

It Would take less time to manusacture than it Would be hand made and it also provides a Way the manusacturer is using less material Which allows them to save more money.

Not all products can be mass-manufactured.

(b) Explain why some products are not suitable for mass-manufacture. 1

Is there is small details in the product they could some times be manusactured Wrong.

**10.** Manufacturers often use standard components such as the part shown below.

Outline the benefits of using standard components to the manufacturer. 3

It takes up less material, it is also easy to mansacture and could take the prise os the product down. It would also limet the chances os the product breaking.

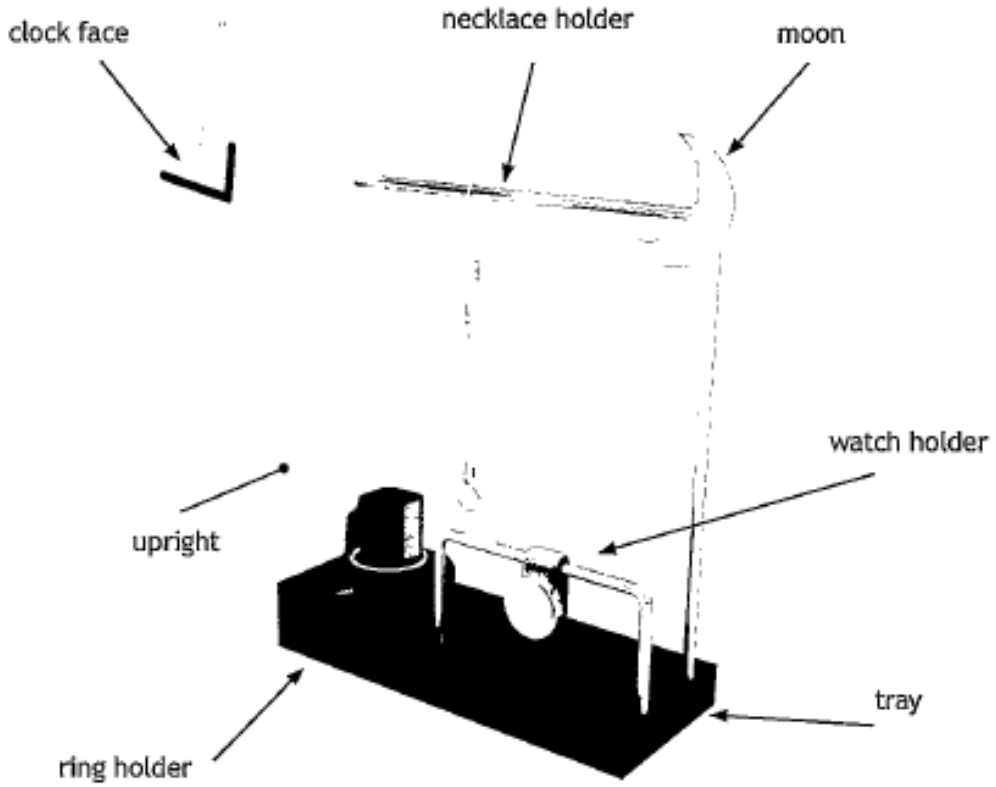
11. Manufacturers have a responsibility to reduce landfill waste by extending product life expectancy.

Outline **three** steps that manufacturers could take to extend the life expectancy of a product. 3

They could make the quility os material alot better helping prevent the product srom breaking, they could also make more things power through Solar power insted os the use os batteries and electricity, and they could also put a warrenty on all products bought, which would allow the manusactures to sixc the product.

# Candidate 8 evidence

1. A design proposal for a jewellery organiser is shown below.




(a) The ring holder and tray were manufactured from a stained softwood.

(i) Name a suitable softwood for the ring holder and tray. 1

[redacted] Red Pine

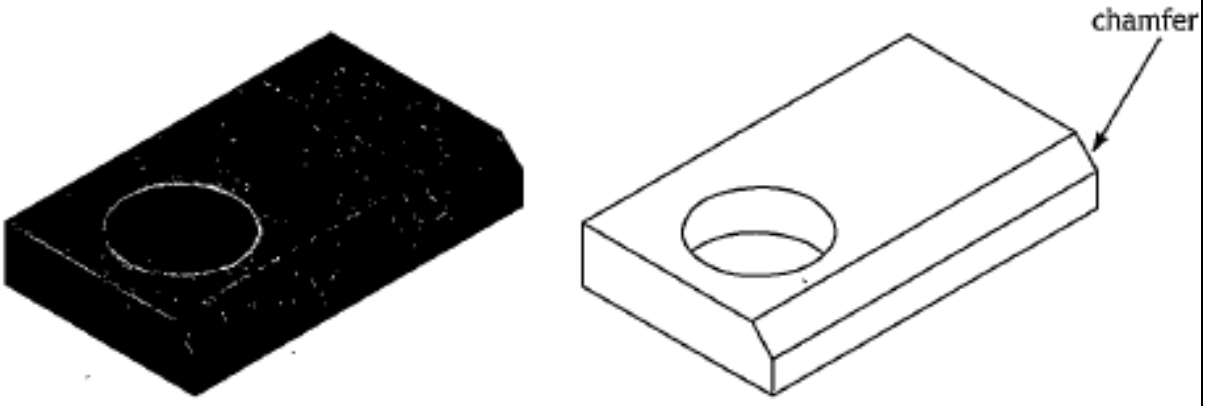
A flat-bottomed hole was drilled into the ring holder to store rings.

(ii) Name the suitable drill bit that could be used to drill a flat-bottomed hole. 1

fastner bit

1. **(continued)**

The edge of the ring holder was chamfered.




(iii) Name the suitable hand tool that could be used to create the chamfer. 1

wooden plane

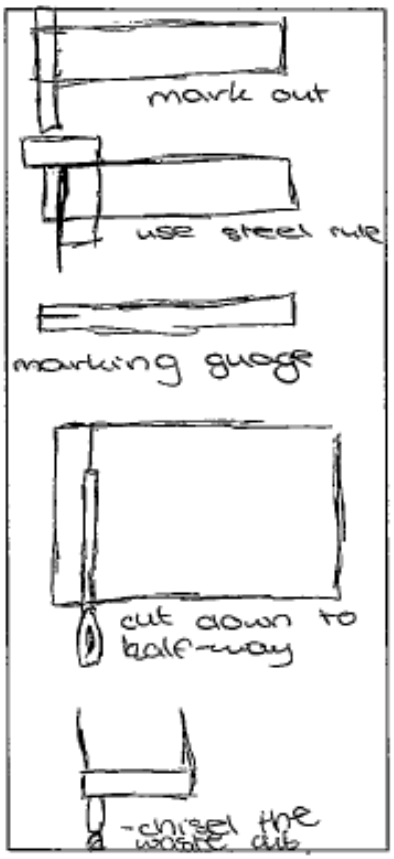
1. (continued)

(b) The tray was manufactured using a corner rebate joint.

(i) Describe how the corner rebate joint could be marked and cut out accurately. You must refer to workshop tools in your answer. 4

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

you would use a steel rule and pen to mark out sizes. Then you would use a tri-square to bring the markings into a straight line. You then use a marking guage and set it to half the depth of the wood. and go over it with a pen.




You then use a tenon saw and saw down to the midale of the wood.

and ~~steel~~ chisel the joint out.

1. (b) (continued)

(ii) Name another suitable joint that could be used for the corners of the tray. 1

finger joint

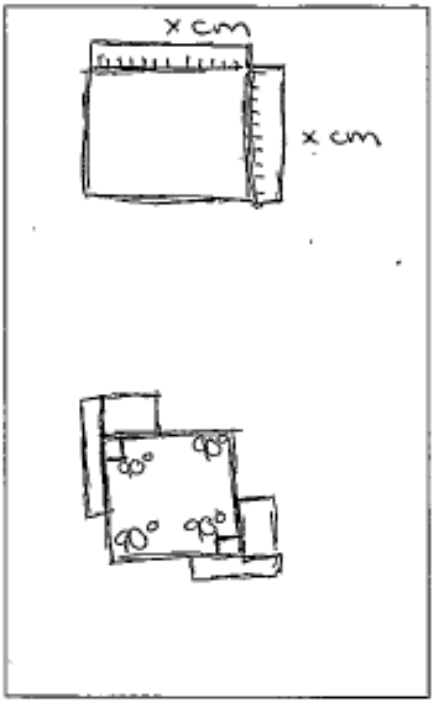
The tray was checked for squareness during assembly.

(iii) Outline two methods of checking the frame is square. 2

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

use a steel rule to check if all sides are the same length

use a tri-square to check if all corners are at 90° angles.




The softwood tray was assembled using an adhesive.

(iv) Name the appropriate adhesive for assembling the softwood tray. 1

wood glue

**1. (b) (continued)**

All wooden components were prepared for a stained finish.

(v) Describe **three** stages in the preparation of the wooden components before applying stain. **3**

- sand down surfaces to get rid of any pen/pencil marks
- wipe down surfaces to remove dust
- raise the grain

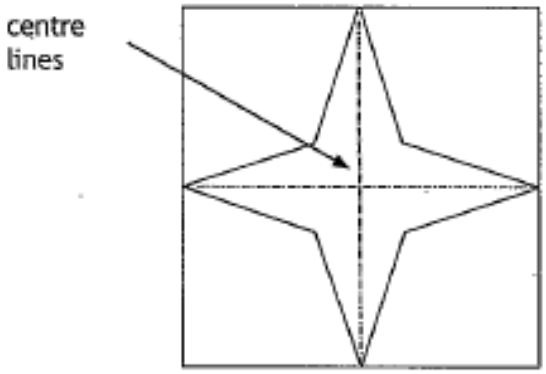
(c) The clock face was made from brass.

(i) State **two** reasons why brass is a suitable material for the clock face. **2**

- comes in large sheets
- it contrasts the wood with the difference in material

1. (c) (continued)

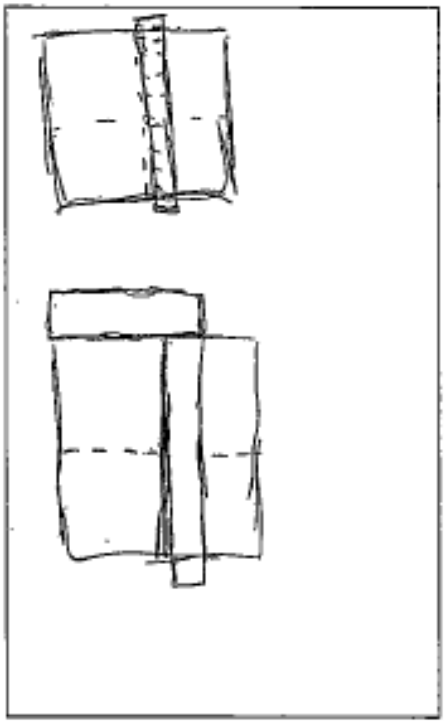
The brass clock face was marked out as shown below.




(ii) Describe how to mark out the centre lines of the clock face, with reference to workshop tools. 2

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

Use a steel rule to mark out where the lines would go, then use an engineers square to draw on the lines and ensure they are straight.



A hand tool was used to cut out the star shape.

(iii) Name an appropriate hand tool that could be used to cut out the star. 1

coping saw

1. **(continued)**

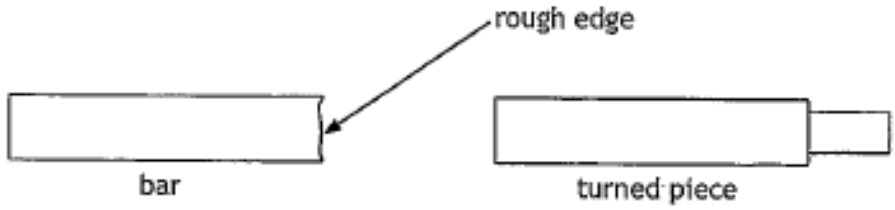
(d) The ends of the necklace hanger were turned on a centre lathe as shown below.

(i) Outline **two** safety checks that must be carried out on the centre lathe **before** turning. **2**

the correct speed is set
the correct tool is being used
the metal is in securely.

1. (d) (continued)

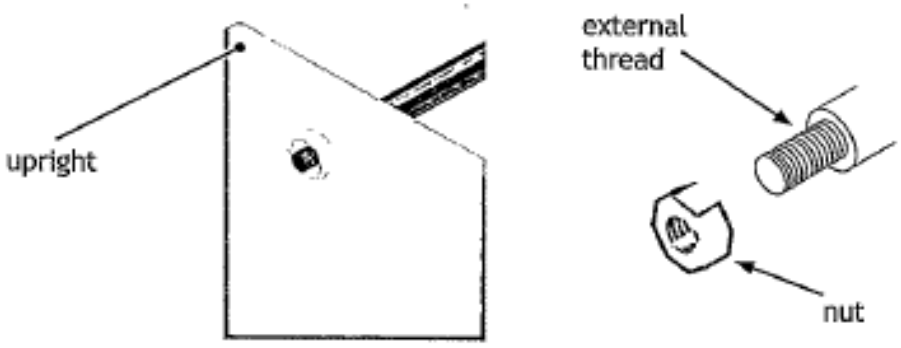
The bar was supplied as shown below.




(ii) Name two processes that would be carried out on the centre lathe to create the turned piece. 2

parallel turning
facing off

An external thread was cut on the end of the bar to allow it to be attached to the upright using a nut.

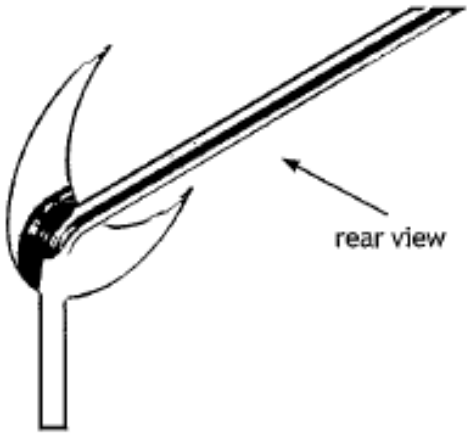



(iii) Describe two ways of ensuring a good quality thread is cut. 2

- make sure the die is secure in the die stock
- that the die has sharp edges to cut
- the metal bar was clean

**1. (d) (continued)**

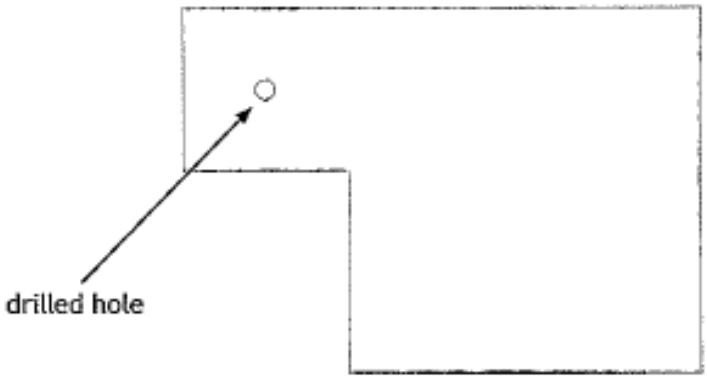
The brass moon was permanently joined to the brass bar.




(iv) Name a suitable adhesive for permanently joining the moon to the bar. 1

epoxy resin

(e) A hole was drilled in the acrylic upright to allow the clock mechanism to be held.

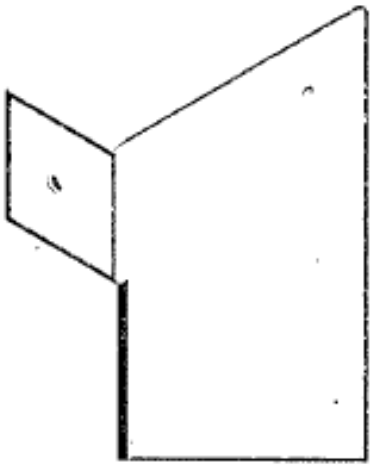



(i) Outline **one** method of preventing the acrylic cracking during drilling. 1

- use the drill very slowly
- clamp the plastic down before drilling

1. (e) (continued)

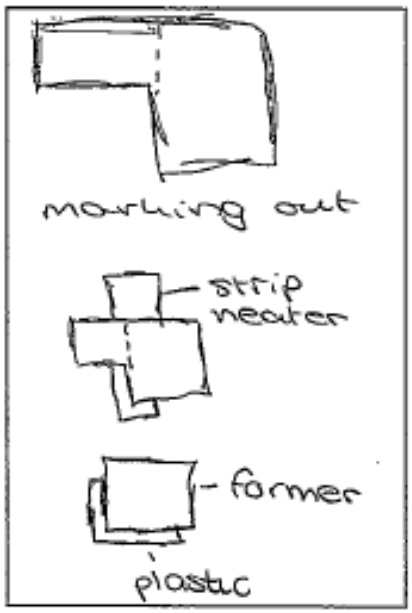
The upright was bent to a right angle as shown below.



(ii) Describe how the right-angled bend could be formed accurately, with reference to workshop tools. 2

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

mark out where the bend will go. then use a strip heater to heat up area. then put the plastic around a former and leave until set.




(iii) Explain why the hole was drilled in the upright before the bend was formed. 1

it was easier to do it earlier as it was easier to clamp down to the drill.

2. When carrying out research, a variety of methods can be used to gather information.

(a) Explain the benefits of using a questionnaire to gather information. 3

- can ask specific questions
- anyone can fill them out.
- results are easily gathered and put into charts.

After completing the research, a product specification can be produced.

(b) Describe how a specification can be used during the design process. 1

it can be used as an ongoing evaluation tool.

**3.** Brainstorming can be used as an idea generation technique.

(a) Describe the key stages of brainstorming. **3**

a group of people write any idea that comes into their head. then you checle for any duplicates between the group and remove them - results are presented. and you can narrow down your choices.

(b) Name another idea generation technique. **1**

SCAMPER

4. Designers use graphic techniques at different stages of the design process.

(a) Outline two reasons why sketching is a suitable graphic technique to use when generating ideas. 2

- it can give a rough idea of the design they were envisioning.
- it is a quicle process to do

(b) Outline two reasons why a designer will produce working drawings during the planning for manufacture stage. 2

- the drawings can show how the parts are going to join up
- the drawings show the sizes of [redacted] each part.

4. (continued)

During the design process designers can use computer generated and physical models.

(c) Explain the benefits of using physical models such as sketch, scale or block models during the design process. 3

such as sketch

By using physical models you can see what your model looks like dismantled and as one product

By using scale models you can compare sizes and check proportions of different parts

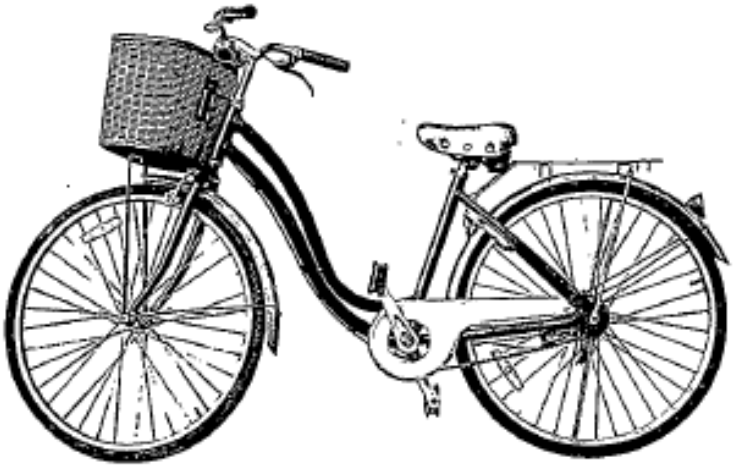
By using block models you can look at your design from different angles and in 3D

**5.** A kettle is shown below.

Describe how ergonomics may have influenced the design of the kettle. 4

- the red button is easy to push down.
- the handle width is suited to the average adults
- the handle length is suited to fit the average adults hand and have excess room.
- the kettle is lightweight so it can be easily lifted by an adult.
- the black button to open the kettle can be easily pressed and easily accessed.

6. A bicycle is shown below.



*You must give different examples for (a) and (b).*

Describe how the following design factors may have influenced the design of the bicycle:

(a) safety. 3

- the basket is below eye-level so you can still see were your pedalling.
- the chain is guarded so you don't hit it while pedalling.
- there are reflective lights on it so you can ride safely in the dark.

(b) function. 3

- the pedals are easy to reach from where your sitting to pedal.
- you don't need a lot of strength to start pedalling and get the bike moving.
- the handle bars are within arms reach.

**7.** Three clocks are shown below.

Clock A

Clock B

Clock C

(a) Describe how the clocks **compare** aesthetically. 3

*You should compare **three** different aesthetic aspects.*

- All three clocks have a different way of representing the numbers.
- All three clocks have an overall different [redacted] frame.
- All three clocks are different sizes
- All three clocks would appeal to different target markets.

7. **(continued)**

Brand image is important to many companies.

(b) Describe **two** benefits of a strong brand image. 2

- strong brands have loyal customers. if one product was good then
- the other ones are likely to be good too.
- good reputation.

**8.** Two mass manufactured taps are shown below.

Metal Tap

Plastic Tap

| Metals |
|---|
| • Mild steel |
| • Copper |
| • Iron |

| Plastics |
|---|
| • Acrylic |
| • Urea formaldehyde |
| • ABS |

*A different reason must be given for the suitability of each material.*

(a) A metal tap is shown above.

(i) Name the most suitable metal from the list provided. **1**

copper

(ii) State why the metal you have selected would be suitable for the tap. **1**

it's corrosion resistant therefore won't rust.

(b) A plastic tap is shown above.

(i) Name the most suitable plastic from the list provided. **1**

Urea formaldehyde

(ii) State why the plastic you have selected would be suitable for the tap. **1**

its thermo-set so no temperature/ heat will affect it's performance.

8. **(continued)**

Mass manufacturing processes were used to produce the taps.

*You must give different responses in (c) and (d).*

(c) State **two** identifying features that would show the plastic tap was injection moulded. **2**

split lines
injection marks
intricate detail.

(d) Outline **two** reasons why die casting is a suitable process for mass manufacturing the metal taps. **2**

all products would be identical
machines can work 24|7

8. **(continued)**

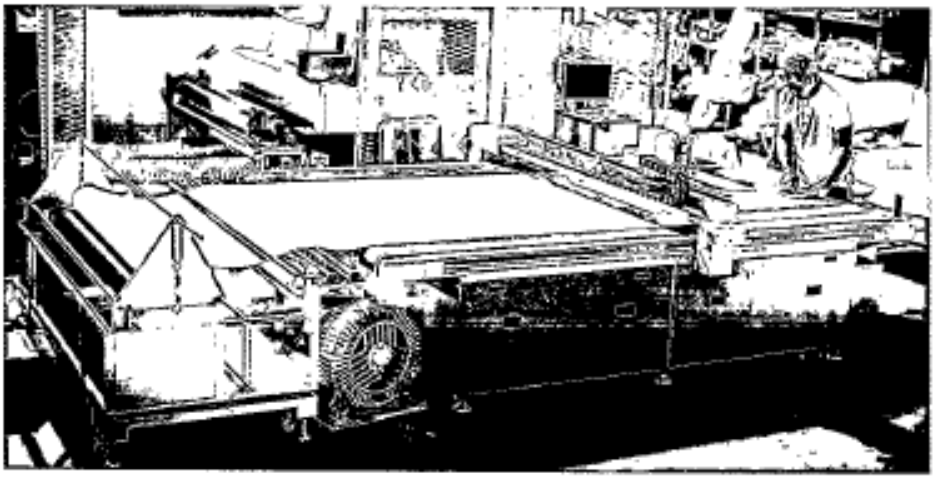
A thermoplastic water tank is shown below.

(e) Name an appropriate process to manufacture the thermoplastic water tank and state why it is suitable. **2**

Process rotational moulding

Suitable because it creates a hollow product

**9.** Computer Aided Manufacture (CAM) is often used in the mass-manufacture of products.



(a) Explain the benefits of CAM to the manufacturer. 3

no skill required to work it. machine can work 24/7 with no breaks guarantee that all products will be the same.

Not all products can be mass-manufactured.

(b) Explain why some products are not suitable for mass-manufacture. 1

some sets are personalised and are one-offs which require more attention and skill

**10.** Manufacturers often use standard components such as the part shown below.

Outline the benefits of using standard components to the manufacturer. **3**

- can buy them in bulk
- all of them are the same
- saves time rather than making them all.
- they are cheaper to buy rather than make.

11. Manufacturers have a responsibility to reduce landfill waste by extending product life expectancy.

Outline **three** steps that manufacturers could take to extend the life expectancy of a product. 3

- make recyclable parts.
- make products designed to dismantle. so that one part can be changed rather than the whole thing.
- use sustainable materials.
- consider packaging so products come in one piece