Candidate 8

SECTION 1 — 60 marks
Attempt ALL questions

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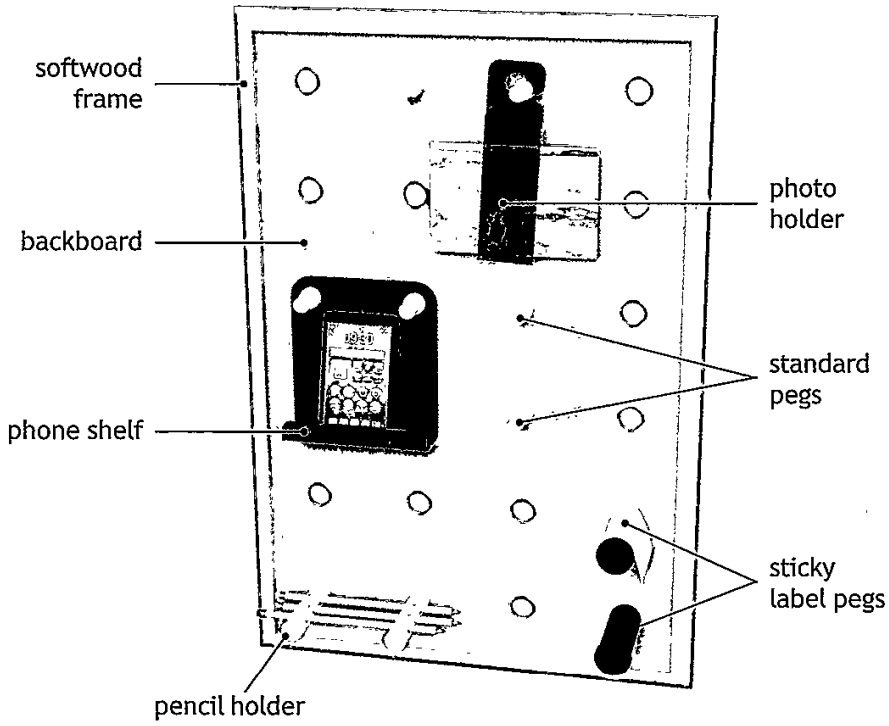
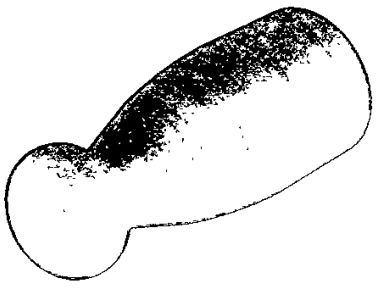
1. A design proposal for a peg board and accessories is shown below.



(a) The standard pegs were made from hardwood.



(i) Name a suitable light coloured hardwood for the standard peg. 1

oak

1. (a) (continued)

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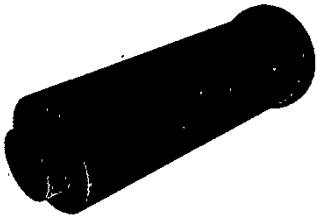
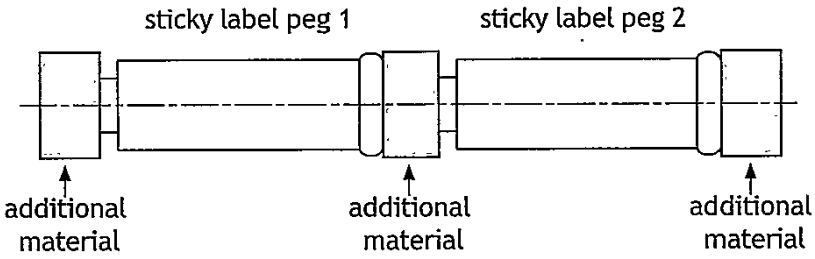
Two sticky label pegs were turned on the wood lathe from a single length of wood.

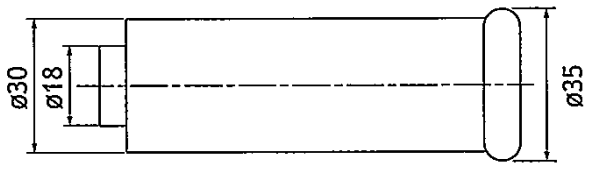




(ii) Outline **two** reasons why additional material is included on the length of wood. **2**

The additional wood provides some space for errors/mistakes. The 2 end pieces allow the front and back points to enter through the spare material meaning no holes will be in the pegs.

The sticky label pegs were turned to the sizes shown below.



(iii) Name the lathe process carried out to reduce the diameter from 35 to 30mm. **1**

parallel turning

(iv) Name the hand tool that should be used to check that the diameters are the correct size. **1**

callipers

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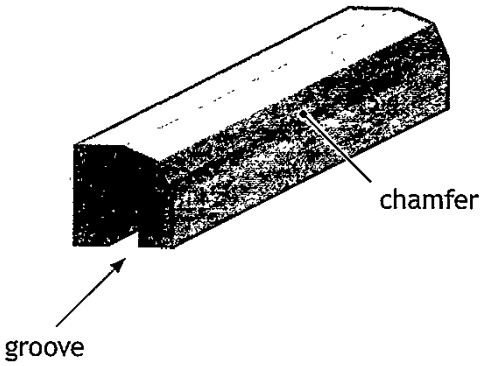
1. (continued)

(b) The four sides of the frame were cut from one length of wood and shaped as shown below.



Complete the sequence of operations shown below by filling in the appropriate process and tools.

(i)

Step	Process	Tools
1	Mark lengths	Try-square, rule, pencil
2	Mark chamfer	Compass
3		Plough plane
4	Cut chamfer	Sander
5	Cut lengths	tenon saw

4

(ii) Explain why Step 4 was carried out before Step 5 in the table above. 1

So that the chamfer is consistent throughout the entire piece of wood

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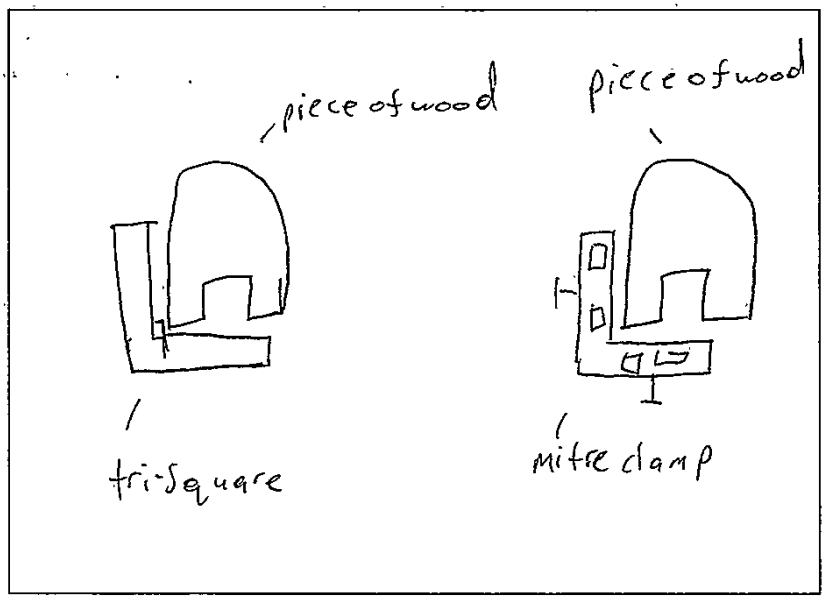
1. (b) (continued)

The frame was checked for squareness during assembly.

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

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

using a tri-square and pressing it against the corner or attaching a mitre clamp



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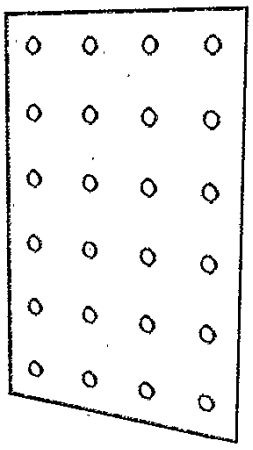
1. **(continued)**

(c) MDF was used to make the backboard.



(i) State **two** reasons why MDF is a suitable choice of material for the backboard. 2

MDF is easy to work with, readily
avaible and once painted holds
an appealling finish.

A pillar drill was used to create the holes.

(ii) State **two** safety checks that must be carried out on the pillar drill before use. 2

All loose clothing must be tuchin away,
the pillar drills protective shield must be
down and there must be some scrap
material for the drill to hit into.

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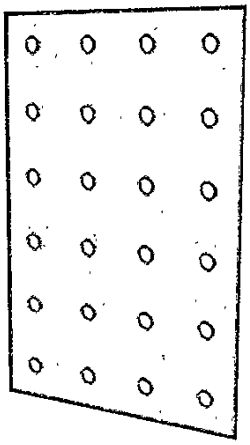
1. (c) (continued)

Grey paint was applied to the surface of the backboard.



(iii) Describe **three** ways to ensure a high quality paint finish. 3

~~The~~ Sand all sides of the MDF first, then apply MDF Sealant and finish with multiple coats of paint.

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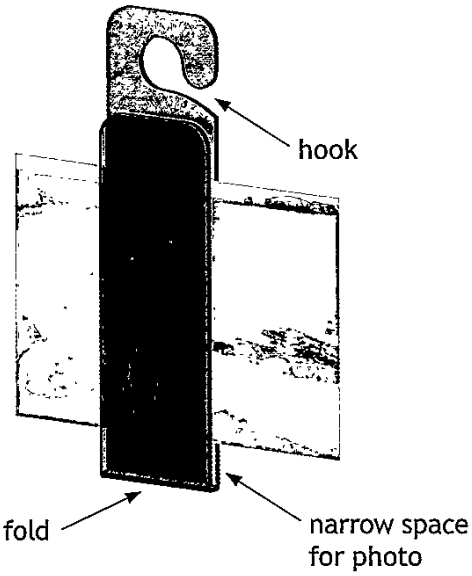
1. (continued)

(d) A photo holder was made from thermoplastic sheet.



The thermoplastic sheet was marked out and folded to securely hold a photo.

Describe how the photo holder would have been folded into shape, with reference to workshop tools and equipment. 2

The plastic sheet would be placed over a strip heater until ~~the~~ it became foldable, it would then be bent in a vice or with a mallet until its in its desired shape.

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1. **(continued)**

(e) The phone shelf was made from copper sheet.

(i) State **two** reasons why copper is a suitable choice of material for the phone shelf. 2

Copper is easy to work with, readily available, cheap, paintable and is strong.

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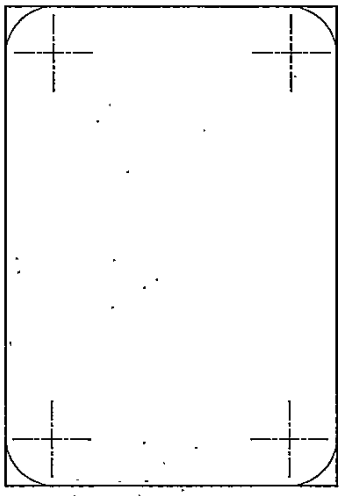
1. (e) (continued) MARKS | DO NOT WRITE IN THIS MARGIN

The phone shelf corners were marked out on a sheet of copper as shown below.



(ii) Describe how to mark out the corners, with reference to workshop tools.

You may use sketches to illustrate your answer in the box below. 3

The 'T' like shapes would be marked out first with a rule and a sriber and then centre punched, a compass would then be placed in the centre punched hole and a length would be chosen and marked out with the compass.

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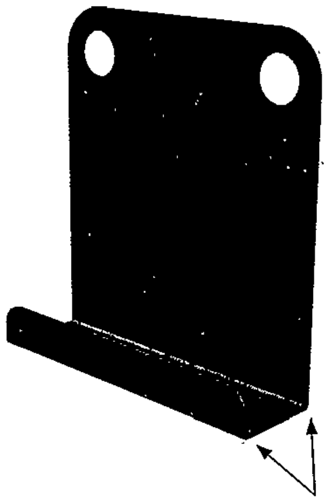
1. (e) (continued)

(iii) Describe how to cut and shape the corners, with reference to workshop tools. **2**

An abra file would be used to cut the corners and they would be filed down to become round. ~~[illegible]~~



90° bends

(iv) Describe how to form the 90° bends, with reference to workshop tools. **2**

~~[illegible]~~ The metal would be placed in a vice and malleted repeatedly until the bends are at 90°.

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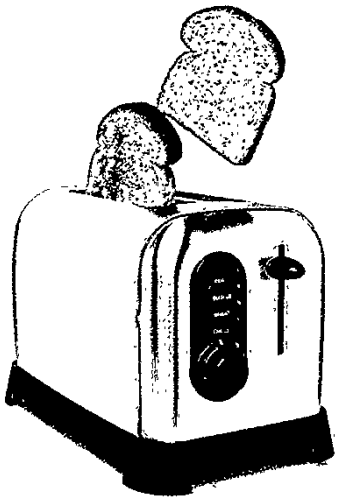
MARKS | DO NOT WRITE IN THIS MARGIN

2. A company that manufactures kitchen appliances wishes to add a toaster to their range.



(a) The designer used a questionnaire to research existing toasters.

(i) Describe the key stages of a questionnaire. **3**

A questionnaire must address multiple options, ranges, choices, ages and so on. Most of the questions must be based around the given topic in order to collect the most reliable information.

(ii) Name an alternative research technique which the designer may have used. **1**

The internet

MARKS | DO NOT WRITE IN THIS MARGIN

2. (continued)

The designer produced a product specification after completing the research.

(b) Explain why a specification is used during the design process. 1

To allow the designer to ~~[illegible]~~ make a checklist of what his product must be/do.

The designer used brainstorming as an idea generation technique.

(c) Describe the key stages of brainstorming. 3

To write down everything that comes to your head in order to gain ideas, once ideas have been collected the designer can then narrow down his options and come to a final proposal to make or work from.

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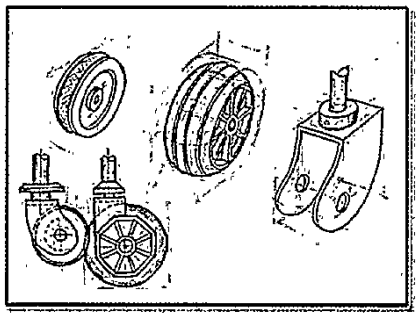
MARKS | DO NOT WRITE IN THIS MARGIN

3. A range of graphic techniques were used throughout the design of the trolley wheel shown below.



(a) Sketches were used at the initial ideas stage.

State **two** reasons why this graphic technique is appropriate. 2

It allows the designer to see the internal parts of the wheel and be able to choose dimensions and sizes.

(b) During the planning for manufacture stage, the designer would produce working drawings.

State **two** reasons why working drawings are required. 2

working drawing are required in order to show other workers or the consumer what you plan on doing, it also displays the dimensions and sizes that have bee chosen, A plan to follow.

MARKS | DO NOT WRITE IN THIS MARGIN

4. Models are often used during the design process.

Explain why models may be used during the design process. 3

Models allow quick and cheap access to showing you what the final or intial product will look like and some model allow for colour selection.

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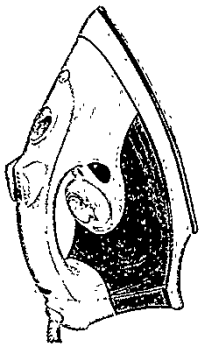
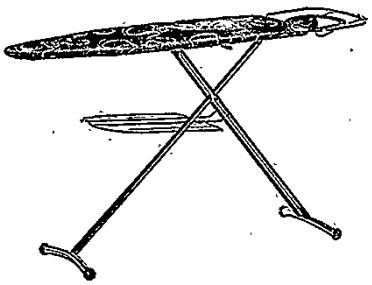
5. An iron and ironing board are shown below.





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

(a) Describe how ergonomics may have influenced the design of the iron and/or the ironing board. 4

a) The iron is influenced by physiology as the length, grip, and comfort of the handle had to be taken into account.

b) The iron is influenced by psychology as the buttons, knobs and switches have to be easy to identify therefore putting temperatures and numbers on the iron.

c) The iron is influenced by Anthropometrics as the iron has to be a manageable weight and the handle has to be able to fit the majority of hand sizes.

MARKS | DO NOT WRITE IN THIS MARGIN

5. (continued)

(b) Describe how function may have influenced the design of the iron and/or the ironing board. 2

The iron is influenced by function as the iron must be able to do its primary function which is to turn water into hot steam and be released when the user commands.

(c) Describe how safety may have influenced the design of the iron and/or the ironing board. 2

The ironing board is influenced by Safety as the legs must be secure and be able to hold the weight of the board plus the iron when applied.

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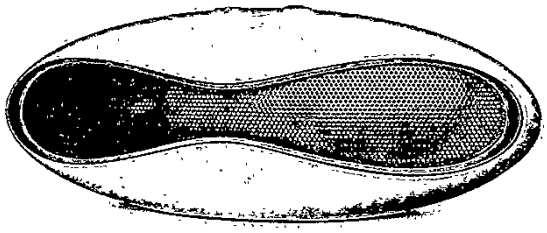
6. A portable speaker is shown below.



(a) Describe **three** aesthetic aspects of the speaker. 3

The speaker features bright and attractive colours, the front of the speaker features a unique shape which is aesthetically pleasing and the outside shape features no corners resulting in a full body smooth and round finish which is also aesthetically pleasing.

The company developing the speaker has a strong brand image.

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

A strong brand image allows the company to be recognised as either good and reliable or the opposite, it also allows the company to sell the speaker at a high price as people will still buy it due to the brand.

Marketing techniques can be used to influence sales.

(c) Name **two** marketing techniques that the company could use to promote the speaker. 2

The company could use radio promoting or TV advertisement or public demos.

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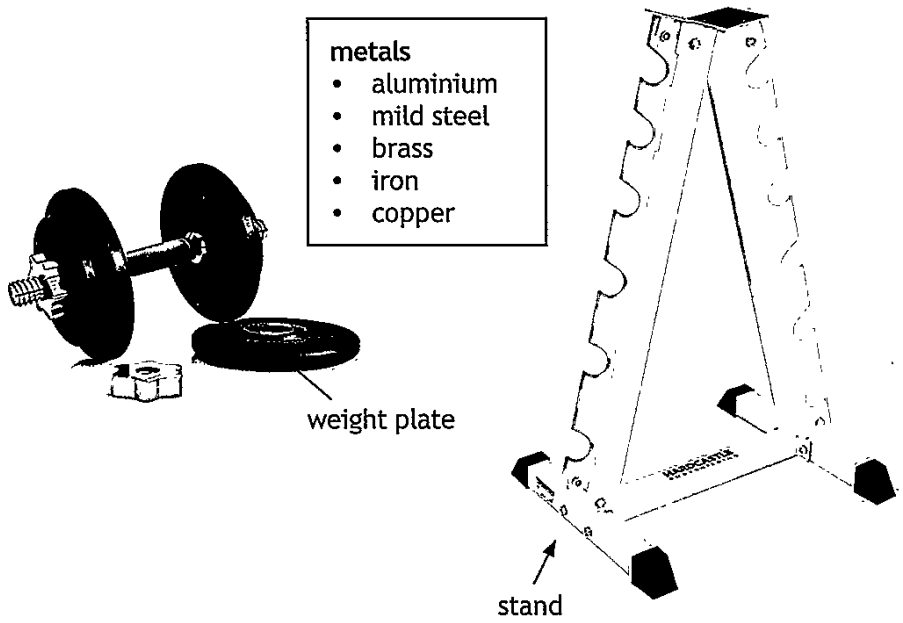
SECTION 2 — 20 marks

Attempt ALL questions

7. The dumbbell and stand shown below have been produced using a range of metals and processes.



(a) Select appropriate metals for the weight plate and stand from the list provided **and** explain why they would be suitable.

You must give a different metal and explanation for each item.

(i) Weight plate. 2

Metal ~~Aluminium~~ Iron

Suitable because there's plenty of it meaning multiple weight plates can be made and it can hold heavyweight

(ii) Stand. 2

Metal mild steel

Suitable because it can be painted allowing for an attractive stand

MARKS | DO NOT WRITE IN THIS MARGIN

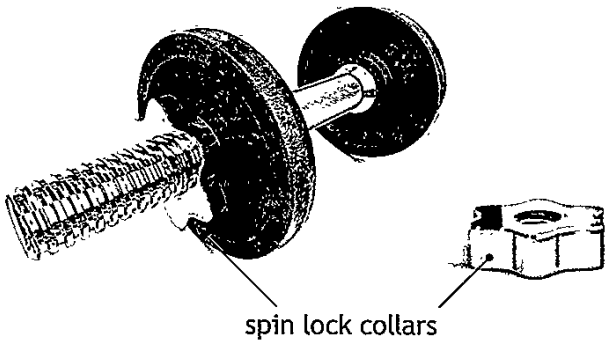
7. (continued)

(b) The weight plates have been sand cast.

Describe **two** identifying features that would show the weight plates have been sand cast. 2

Sand cast marks would be on the plate and possibly heat marks.

(c) The spin lock collars have been die cast.



Explain why die casting was used to manufacture the spin lock collars. 2

It was used as the Spin loch Collars are a complex/unique shape which is too hard to manufacture by hand and they can be mass produced.

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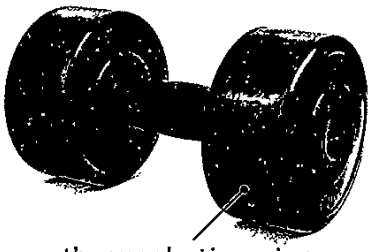
7. (continued)

(d) A concrete filled dumbbell is shown below.



Name a suitable process to manufacture the thermoplastic casing of the dumbbell **and** explain why it is suitable. 2

Process dip coating

Suitable because it will allow the dumbbell to have a more stable grip and an attractive colour.

[Turn over

MARKS | DO NOT WRITE IN THIS MARGIN

8. Many products are mass manufactured.

(a) Describe the impact of mass manufacturing on society. 3

Mass manufacturing allows multiple items to be repeatedly made in massive numbers and sold for cheap prices. Mass manufacturing is good for when a product is in high demand by consumers, the process is also done by machines and programmed to be more accurate than by hand.

Not all products are mass manufactured.

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

Some products require special hand work that machinery might not be capable of.

9. Manufacturers often use standard components in the production of products.
Outline the possible benefits of using standard components. 2

Standard components are readily avaible and always in stock so they can be used frequently for products that require them.

MARKS | DO NOT WRITE IN THIS MARGIN

10. Manufacturers have a responsibility to reduce the damage they cause to the environment.

Outline the steps that a manufacturer could take to reduce their impact on the environment. **4**

Mass manufacturing plants must reduce their Co^2 emissions by switching from fossil fuels to more renewable energy sources, where ever the mass manufacturing plants are built they should try to stay away from places that are populated with living creatures, they should also try to remain from destroying tree populated land to build to build their plants.

[END OF QUESTION PAPER]