Candidate 4

SECTION 1 — 60 marks

Attempt ALL questions

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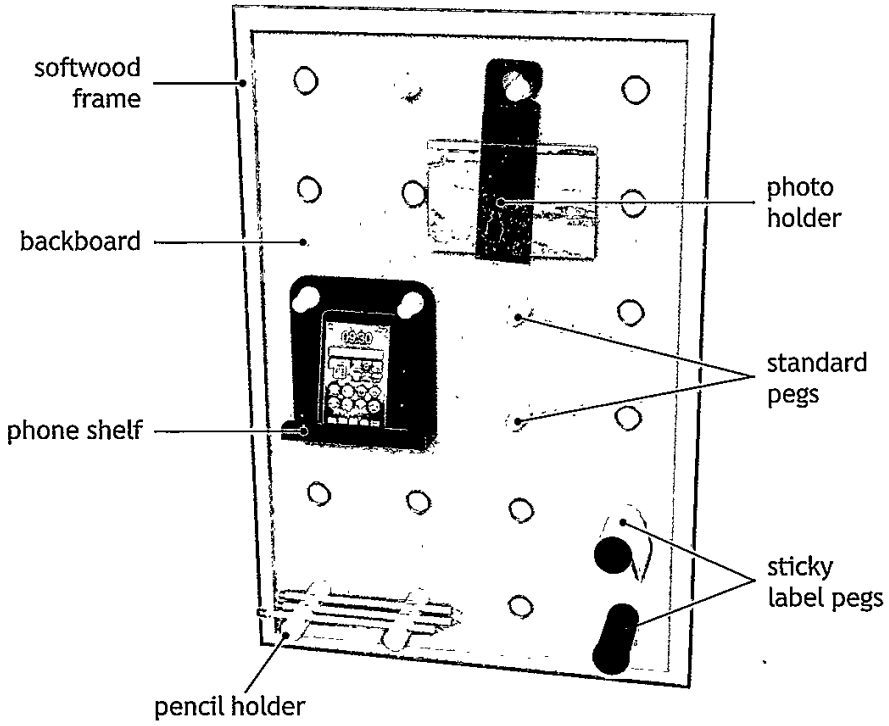
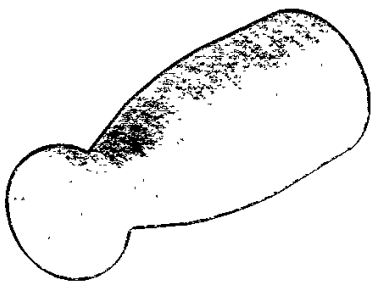
1. A design proposal for a peg board and accessories is shown below.



(a) The standard pegs were made from hardwood.



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

beech

1. (a) (continued)

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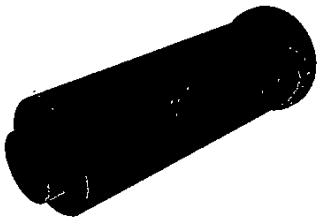
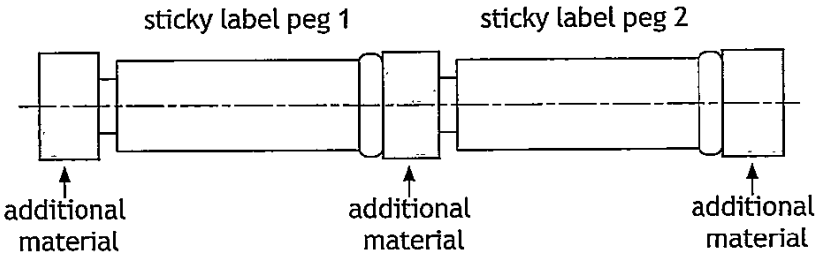
Two sticky label pegs were turned on the wood lathe from a single length of wood.

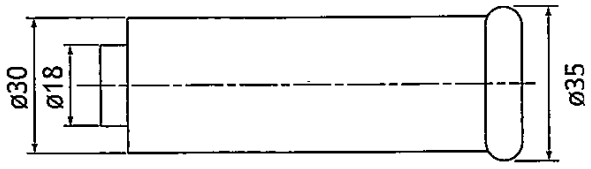




(ii) Outline **two** reasons why additional material is included on the length of wood. 2

additional wood is included so that the legs aren't together and so you don't damage the other leg if you go over the line. Big mistake

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

Parting off

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

outside calipers

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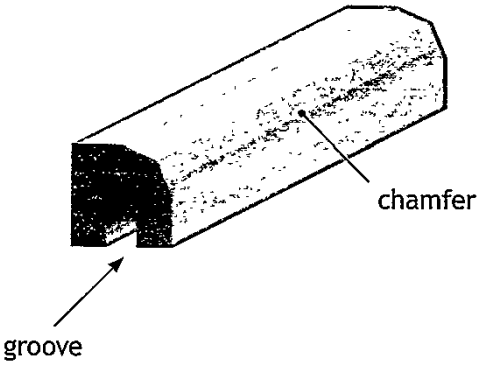
1. (continued)

(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	Sliding bevel, pencil
3	cutting out groove	Plough plane
4	Cut chamfer	coping saw
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 wron piece of material wasnt accidentlg cut off

MARKS | DO NOT WRITE IN THIS MARGIN

1. (b) (continued)

The frame was checked for squareness during assembly.

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

You may use sketches to illustrate your answer in the box below. **2**

you can measure the 2 diagonals of the square and if their the same length then it is right angled. you can also use a try square in the corners and if the try square sits flush with both the bits of wood then it is square

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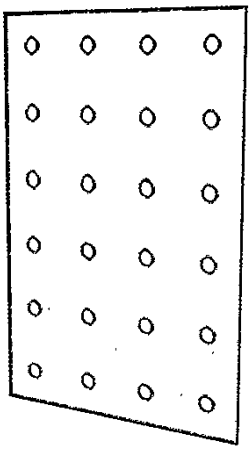
1. **(continued)**

(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 was chosen because ~~MDF is manufactured~~ in big sheets so you can have whatever size you want and it is cheap to ~~buy which reduces the costs~~

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**

check to make sure that the drill bit is properly secured and check to see if it is set to the correct speed. you also need to make sure that you have removed the chuck key

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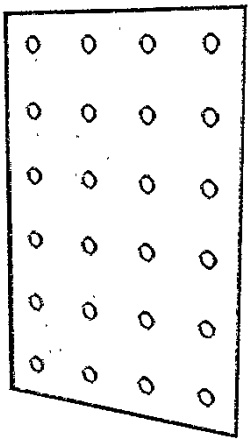
1. (c) (continued)

Grey paint was applied to the surface of the backboard.



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

- you could sand the ~~wood~~ MDF before applying the paint
- you could apply a few coats of paint to ensure it is completly covered
- and you could dip coat it in the grey paint

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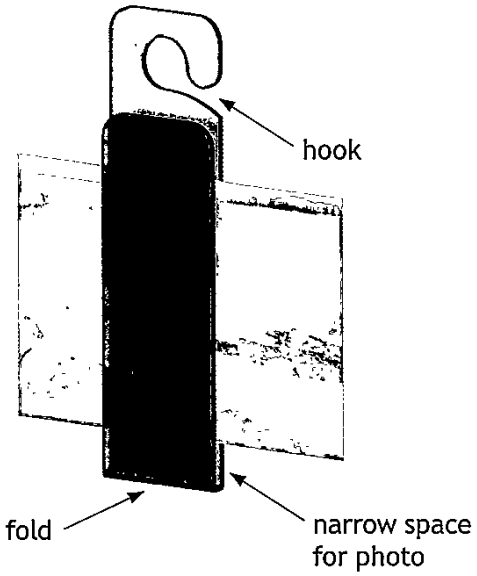
1. **(continued)**

(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

it would have been heated up and a thin pice of material would have been placed where the photo would be to make sure that there was space for the photo to fit into. It then would've been folded over the material and held ~~by~~ in place by han or by a clamp until it cooled down and hardened

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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**

it is soitable because it is strong so it wont breack and it isnt magnetic so your phone wont stick to it

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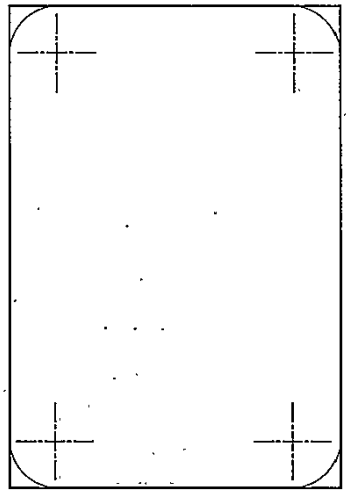
1. (e) (continued) MARKS | DO NOT WRITE IN THIS MARGIN

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**

you would mark out how far in the lines for the holes are and use a engeneers square on a scribk to markk it out. you would then mark the curves out with a spring compas. after you had marked that out you would then cut them out.

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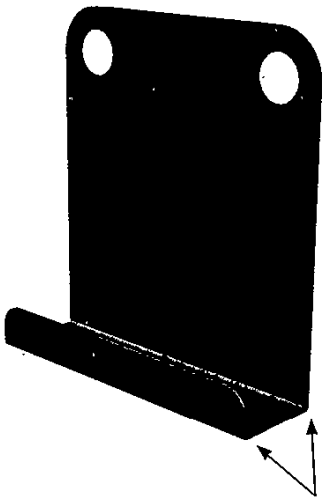
1. (e) (continued)

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

you would cut the corner off by using a hacksaw or a jounior hacksaw and you would then round and smooth it with a file



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

you would bend the 90° angles over a 90° object by using a hind hamer/mallet

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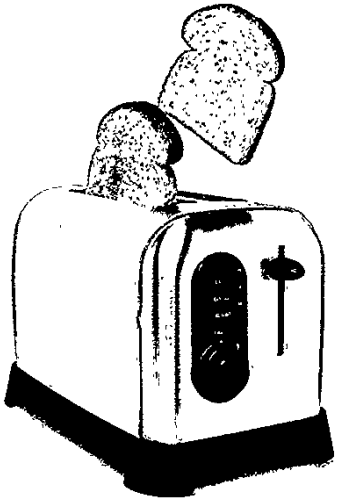
2. A company that manufactures kitchen appliances wishes to add a toaster to their range.



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

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

you make up relevant questions about what your wanting to research. you then ask as many people as you can the questions. once you have finished asking people the questions you gather the information together and use it to help you make a better product

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

a survay

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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 guide the designers on what it is suppose to be like

The designer used brainstorming as an idea generation technique.

(c) Describe the key stages of brainstorming. 3

you would think of what it is that your wanting to desing or what you want your products to be, you would then do a rough sketch of some ideas that you have came up with, you would then do a further more detailed sketch/drawing of your ideas.

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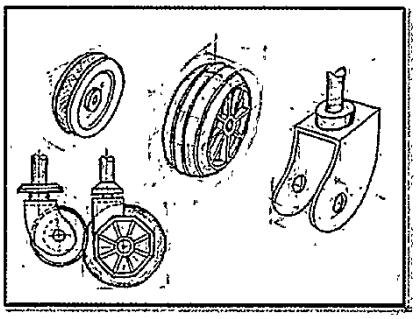
3. A range of graphic techniques were used throughout the design of the trolley wheel shown below.



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

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

it's appropriate because it shows you what it would/could look like and it also lets you make and changes or adjustments to the design and it lets you see multiple different designs to chose from

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

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

they are required to show what the desing/product is going to look like and to use as a refrance of what would have to be changed in the Product.

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

a modk would be used so that the desinger can interact with it and hold it. It's also used because it let's you see the scale and proportion of the modk. It also let's you see the product when in use and see if there is any faults in the desing that needed to be changed

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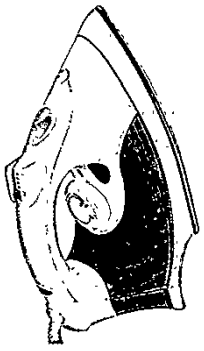
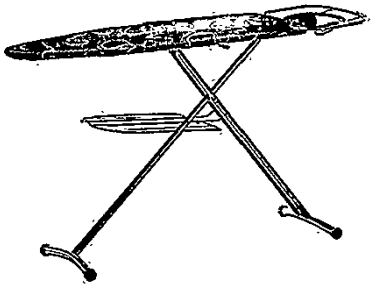
5. An iron and ironing board are shown below.





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

on the iorn the handle would have heen desinged to comfterbly fit the avrage hand size of a person. The buttons on the iorn would have heen desinged to fit the width of any persons thumb. The Iorning board would have heen desinged to ~~[illegible]~~ he able to adjust to ~~[illegible]~~ roughly waist high of the person using it. and the length of the handle would have heen desinged to he the same length of an avrage person

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 length of the legs would have had to be made to a certain size for the required hight of the ironing board and the placment of the buttons wouldive influenced the desing of the iorn so that all the buttons were on in and within reach

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

the ironing board would have been desinged with curves to keep people safe from tripping and hitting their head off of the sharp edges. the ironing board would als have been desinged to be too high for young children to reach so they can't burn themselfs on the hot iorn thats on top of it

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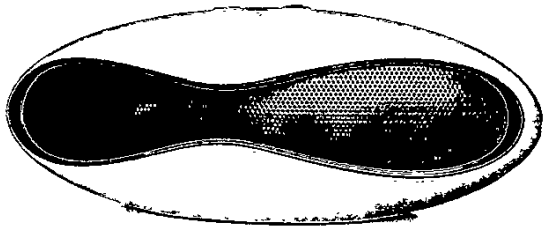
6. A portable speaker is shown below.



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

the speaker is bright and colourful to catch the eye of anyone who might buy it. the speaker is also designed in an irregular shape to make it look unique. The speaker is also smooth which make it pleasing to look at and makes it much more likely to be bought

The company developing the speaker has a strong brand image.

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

it makes the product seem better if it is associated with a popular brand and it would make the product seem a higher quality due to the brand that it's associated with

Marketing techniques can be used to influence sales.

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

a company could use advertising and a free trial to promote the speaker

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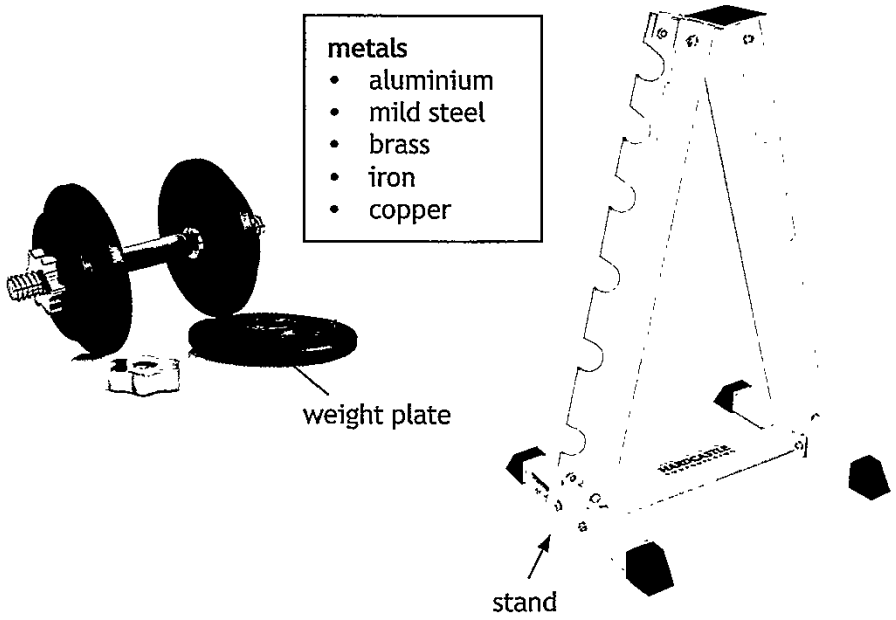
SECTION 2 — 20 marks

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 iorn

Suitable because iorn is heavy and not easily damaged if you drop the domb bell

(ii) Stand. 2

Metal aluminium

Suitable because it is light weyght bat strong so it can hold heavy objects

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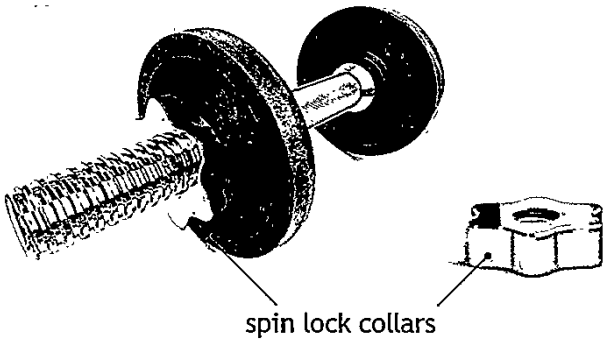
7. (continued)

(b) The weight plates have been sand cast.

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

there would be a roogh texture from the sand and there would be 2 small circles from where the runner and riser was cut off

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



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

So that all of the spin lock collars are exactly the same and so that it fits onto the bar perfectly to hold the weight plates in place

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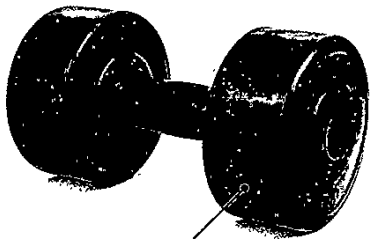
7. (continued)

(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 injection moulding

Suitable because it would mean that the full dumbbell would be properly covered in the plastic casing

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8. Many products are mass manufactured.

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

quite alot of people have the same prodcut since it has been mass manufactured. It would also makes it alot easier for peop le to replace their product it theirs breaks. it would also mean that evrgone would get the same qualit of prodcut so it would be fair

Not all products are mass manufactured.

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

Some products are coustomised and everyone would want their own diffrent desing so it wouldnt be suitable if every individual desing was mass manufactured

9. Manufacturers often use standard components in the production of products.

Outline the possible benefits of using standard components. 2

if a component is lost from a product then the owner could just buy another component that is the exact same to replace the old one and it would mean that many diffrent components would have to be mass manofactured if they werent all the same.

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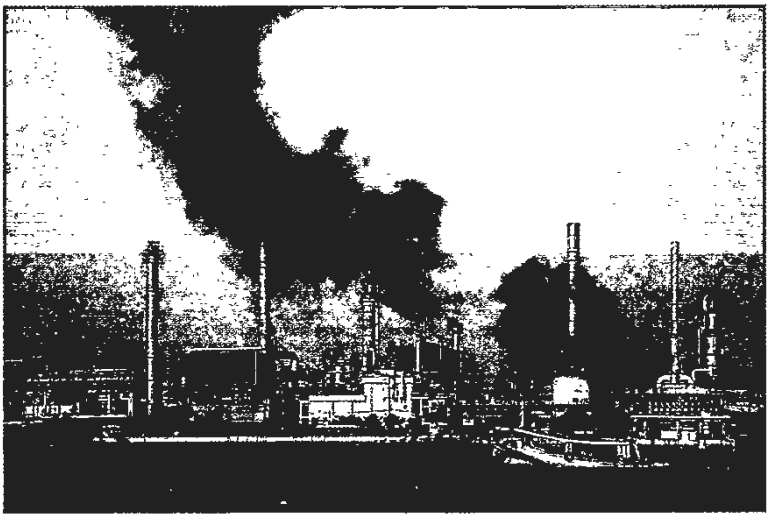
10. Manufacturers have a responsibility to reduce the damage they cause to the environment.



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

if creating a plastic product the manufacturer could recycle old plastic that hasn't been used yet. they could also try not use plastic and find a diffrent material so there isn't as much plastic pollution. instead of using machines which burn electricity the factories could employ more people to reduce the amount of carbon dioxide that is being released into the air and if the product is made out of wood the manufacturers could replant the trees to reduce deforestation