



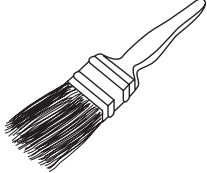
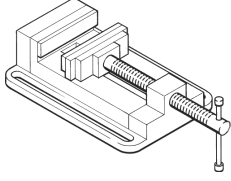

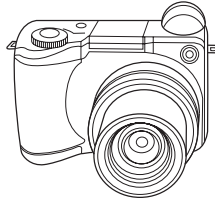
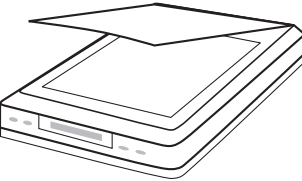

Answer ALL the questions. Write your answers in the spaces provided.

1. The table below shows some tools and equipment.

(a) Complete the table by:

- (i) naming each tool or piece of equipment
- (ii) describing its use.

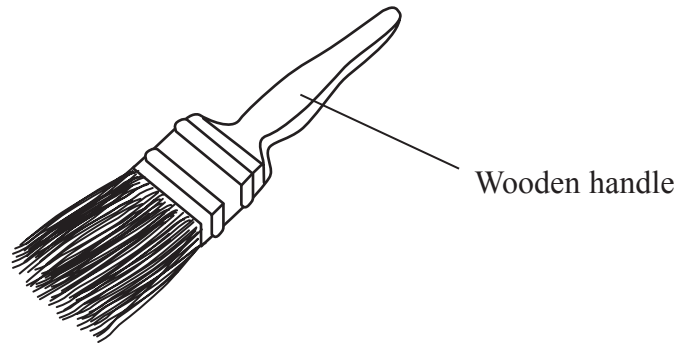
The first one has been done for you.

Tool/Equipment	Name	Use
	Brush	Applying varnish
		
		
		
		
		

(10)



(b) The drawing below shows a brush.



(i) The brush can be used to apply varnish to a wooden tabletop.

Mark with a cross (☒) **one** other finish from the list below that can be applied with a brush.

- plastic dip coating ☒      polish ☒      stain ☒      etching ☒      (1)

(ii) Give **one** reason why the brush should be cleaned after use.

..... (1)

(iii) The wooden handle of the brush has a finished applied to it.

Give **two** reasons for applying a finish to the handle of the brush.

- 1 .....  
2 ..... (2)

(c) The handle of the brush could be manufactured from plastic using the injection moulding process.

Injection moulding is a self-finishing process.

Give **one** reason why a self-finishing process is important in the manufacture of the brush handle.

..... (1)



(d) The manufacturer of the brush uses ICT and computer systems.

Choose terms from the following list to complete the statements below about the use of ICT and computer systems.

Each term may be used **once** or **not at all**.

- |                      |                |                     |
|----------------------|----------------|---------------------|
| <b>EPOS</b>          | <b>barcode</b> | <b>stock levels</b> |
| <b>stock control</b> | <b>scanner</b> | <b>internet</b>     |

Statements about the use of ICT and computer systems.

1. The manufacturer puts a label on the brush and when the ..... is scanned it shows the price of the brush.
2. The manufacturer is able to advertise on the ..... for its customers to see new products.
3. As products are sold and ..... fall, the computer system can automatically order more products. (3)

(e) A designer uses the internet when designing a new handle for the brush.

Give **two** different types of information the designer could gather from the internet when designing a new handle for the brush.

- 1 .....
- 2 ..... (2)

(f) The designer uses CAD software to design a new handle shape for the brush.

Give **two** advantages, for the designer, of using CAD software to design a new handle shape for the brush.

- 1 .....
- 2 ..... (2)

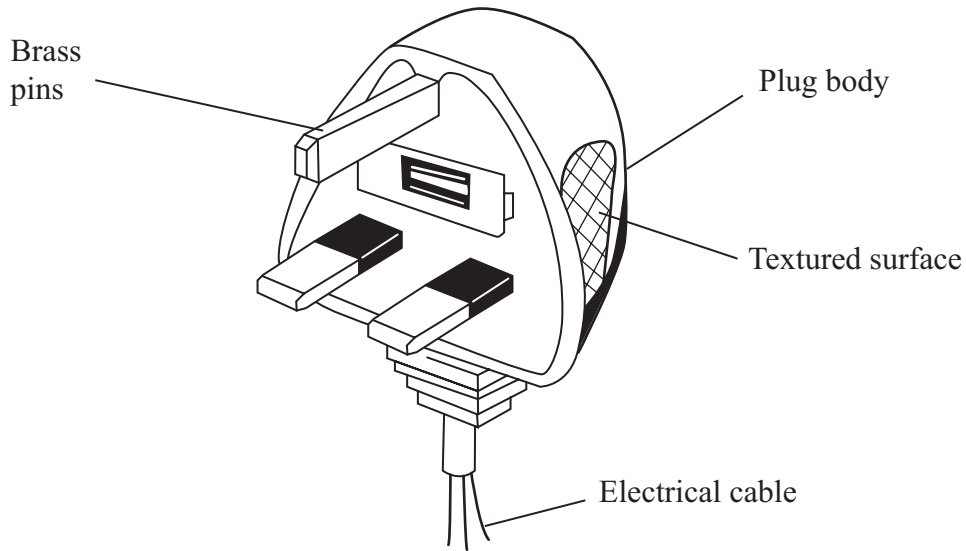
(Total 22 marks)

Q1

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2. The drawing below shows a 3-pin plug.



(a) The plug body has been made from a thermoplastic material.

Mark with a cross (☒) **one** thermoplastic material from the list below that is suitable for the plug body.

- epoxy resin       ABS       polyester

(1)

(b) Brass has been used to make the pins of the plug.

(i) One property of brass is toughness.

Give **two** other properties of brass.

1 .....

2 .....

(2)

(ii) Give **two** reasons why the brass pins must have the property of toughness.

1 .....

2 .....

(2)



(c) Part of the plug has a textured surface.

Give **two** reasons why part of the plug has a textured surface.

- 1 .....
  - 2 .....
- (2)**

(d) (i) Copper wire has been used for the electrical cable.

Give **two** properties of copper that make it suitable for use as the electrical cable.

- 1 .....
  - 2 .....
- (2)**

(ii) The copper wire is coated with a plastic material.

Explain **one** reason why the copper wire is coated with a plastic material.

- .....
  - .....
- (2)**

(e) The plug is marked with a British Standards number.

Give **two** benefits, to the consumer, of the plug being marked with a British Standards number.

- 1 .....
  - 2 .....
- (2)**

(f) A new plug body shape has been designed on a CAD system in preparation for manufacture using CAM.

Give **three** advantages, for the consumer, of the manufacturer using CAD/CAM.

- 1 .....
  - 2 .....
  - 3 .....
- (3)**



(g) (i) Environmental issues are important for manufacturers to consider.

Give **two** environmental issues related to the manufacture of the thermoplastic plug body.

1 .....

2 .....

(2)

(ii) Much of the waste brass from the production of the pins is recycled.

Describe **two** effects on the environment of recycling the waste brass.

1 .....

.....

2 .....

.....

(4)

Q2

(Total 22 marks)

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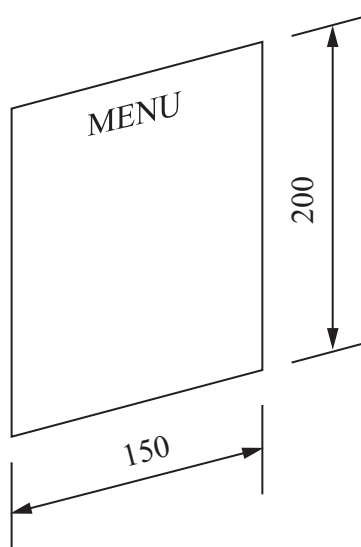
3. An advertising board is needed for a new café called ‘One90’.

The specification for the advertising board is that it must:

- provide a surface which can be written on and wiped clean
- be freestanding and portable
- hold copies of a menu card which can be easily removed
- be made using materials and processes suitable for one-off production.

### ADDITIONAL INFORMATION

Details of the menu card



All dimensions in mm

(a) In the spaces opposite, use sketches and, where necessary, brief notes to show **two different** design ideas for the advertising board that meet this specification.

Do **not** evaluate your designs in part (a).

Candidates are reminded that if pencil is used for diagrams/sketches, it must be dark (HB or B). Coloured pens, pencils and highlighter pens must **not** be used.

**PLEASE DO NOT WRITE OR DRAW IN THIS SPACE.**

**PLEASE USE THE SPACES OPPOSITE FOR YOUR DESIGNS.**





**Design Idea 1**

**(8)**

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**Design Idea 2**

**(8)**



(b) Three of the original specification points are repeated below.

Evaluate how **one** of your design ideas succeeds or fails to meet each of the specification points.

Write the number of your chosen design idea (1 or 2) here .....

(i) The advertising board must provide a surface which can be written on and wiped clean.

.....  
.....  
.....  
.....

(2)

(ii) The advertising board must be freestanding and portable.

.....  
.....  
.....  
.....

(2)

(iii) The advertising board must hold copies of a menu card which can be easily removed.

.....  
.....  
.....  
.....

(2)

**(Total 22 marks)**

**Q3**

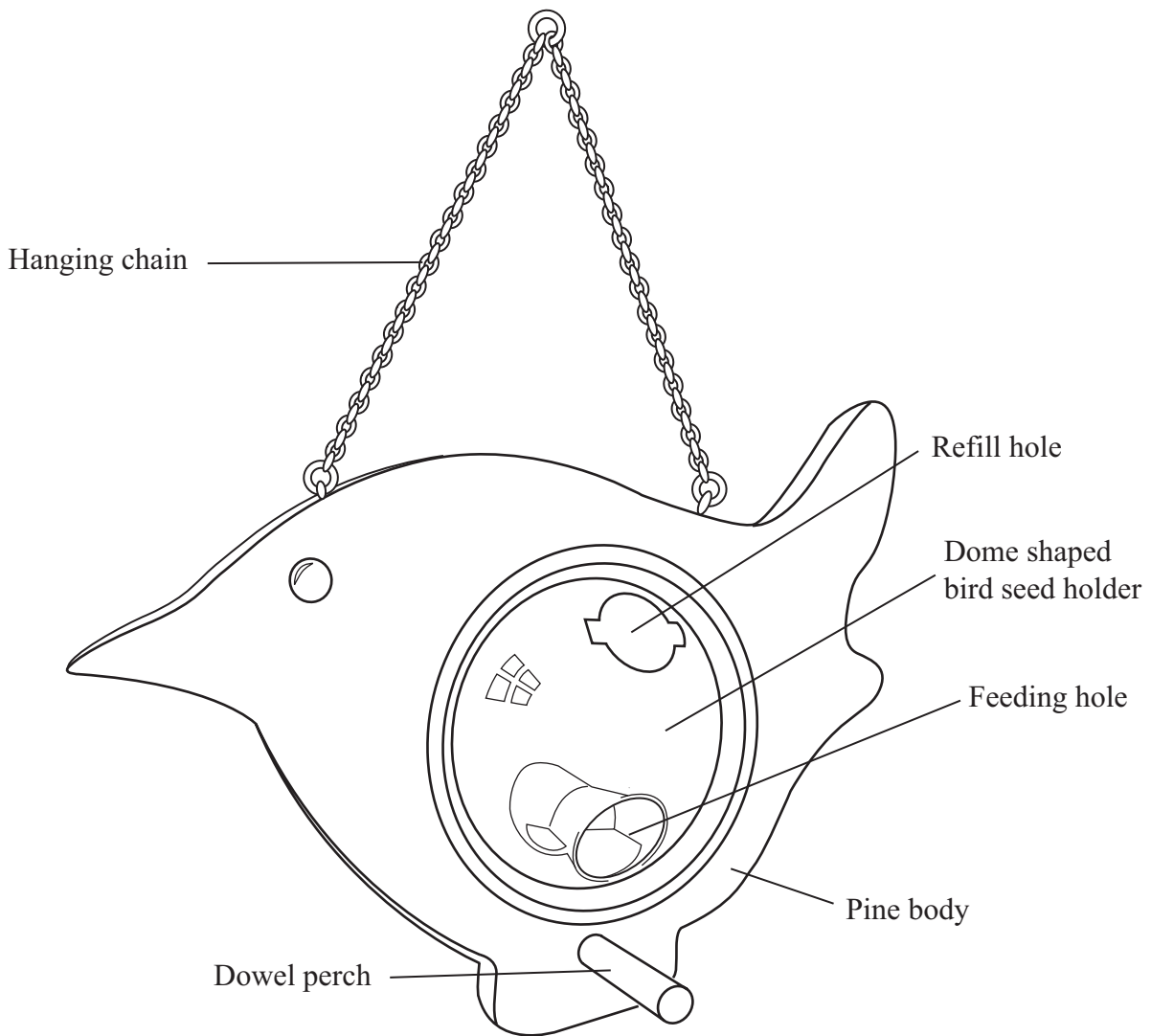
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4. The drawing below shows a bird feeder which holds bird seed.  
It is sold in pet shops and garden centres.



(a) Two specification points for the bird feeder are that it must:

- keep the bird seed dry
- prevent cats from getting at the feeding birds.

Under each of the following headings, give **one** more point that should be included in the specification for the bird feeder.

For each point, give **one** reason why it should be included.

(i) The needs of the user.

Point .....

Reason .....

.....

.....

**(2)**

(ii) Environmental considerations.

Point .....

Reason .....

.....

.....

**(2)**

(iii) Quality.

Point .....

Reason .....

.....

.....

**(2)**



(b) The main body of the bird feeder is made from pine.

One reason for making the main body out of pine is that it can be treated with a preservative.

Give **two** other reasons why pine is a suitable material from which to make the main body.

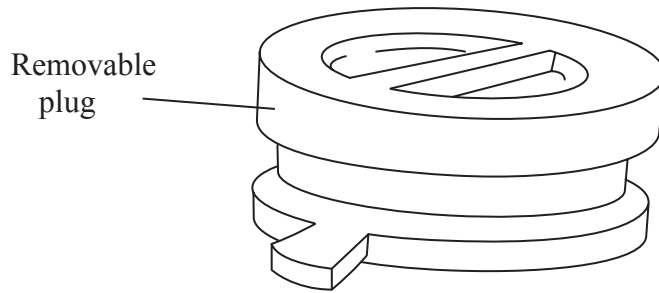
1 .....

2 .....

(2)

(c) The bird seed holder has a removable plug in the refill hole.

The removable plug is made by the injection moulding process.



Give **two** reasons why injection moulding is a suitable process to manufacture the removable plug.

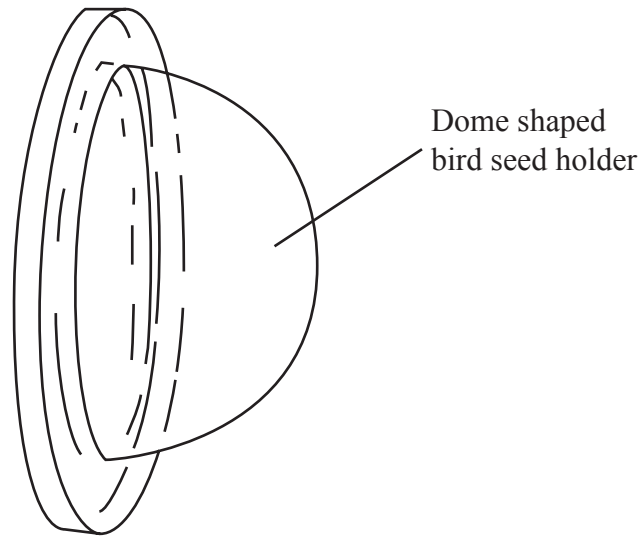
1 .....

2 .....

(2)



(d) The dome shaped bird seed holder is made from acrylic.



Give **two** properties of acrylic that make it suitable for the bird seed holder.

For each property give **one** reason why acrylic is suitable for the bird seed holder.

Property 1 .....

Reason .....

.....

Property 2 .....

Reason .....

.....

**(4)**

(e) Quality control checks are carried out at important stages during the manufacture of the bird seed holder.

Give **two** important quality control checks, other than safety, that should be made during the manufacture of the bird seed holder.

1 .....

2 .....

**(2)**



- (f) The pine body is made in high volume.  
The shape of the pine body is suitable for manufacture using CAM.

Describe **one** way in which the shape of the pine body is suitable for manufacture in high volume using CAM.

.....  
.....  
**(2)**

- (g) Two purposes of the bird feeder are to:

- keep the bird seed dry
- prevent cats from getting at the feeding birds.

Explain, under the following headings, how the bird feeder achieves these purposes.

- (i) Keep the bird seed dry.

.....  
.....  
.....  
.....  
**(2)**

- (ii) Prevent cats from getting at the feeding birds.

.....  
.....  
.....  
.....  
**(2)**

Q4

**(Total 22 marks)**

**TOTAL FOR PAPER: 88 MARKS**

**END**

