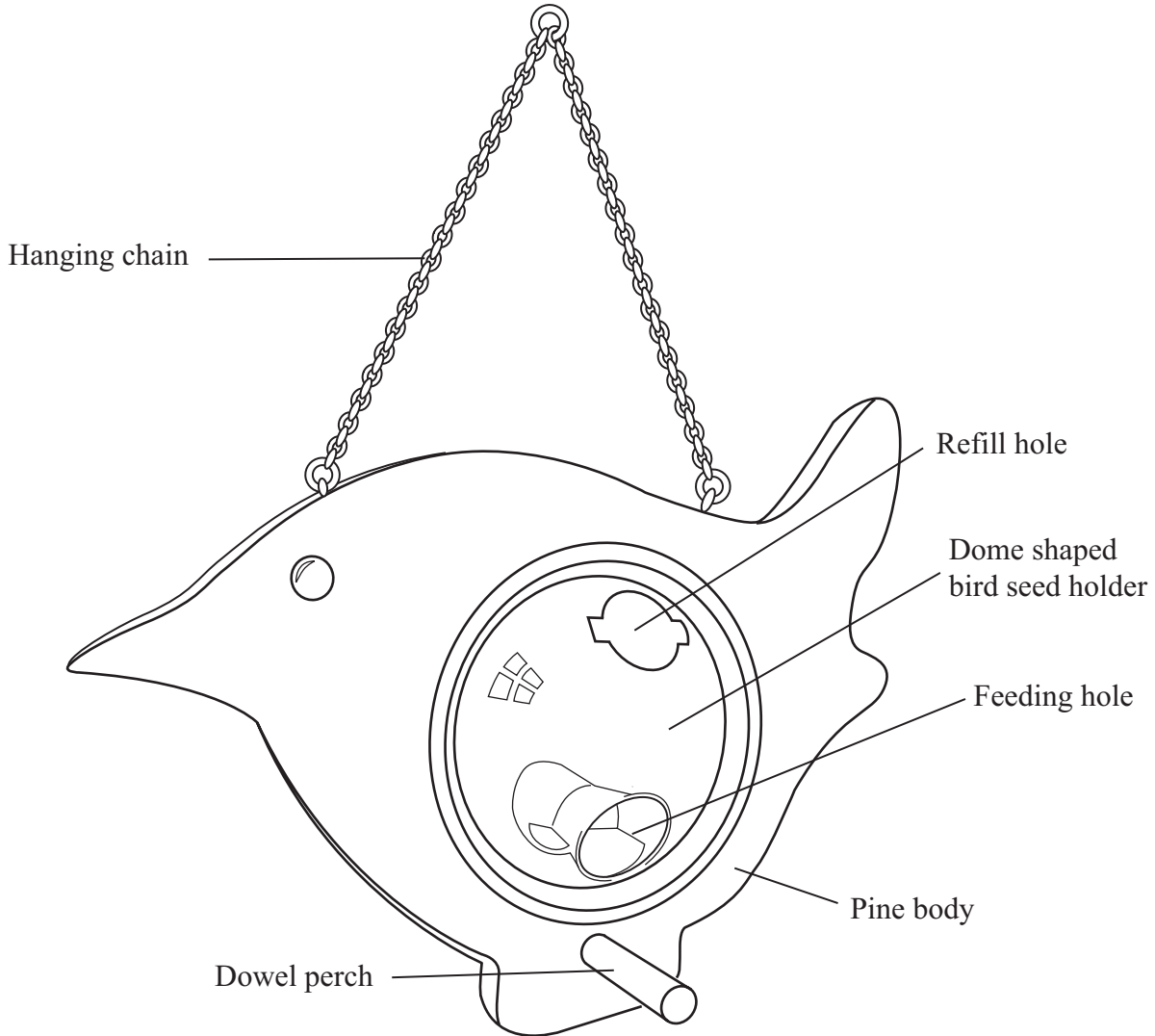




Answer ALL the questions. Write your answers in the spaces provided.

1. 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)**



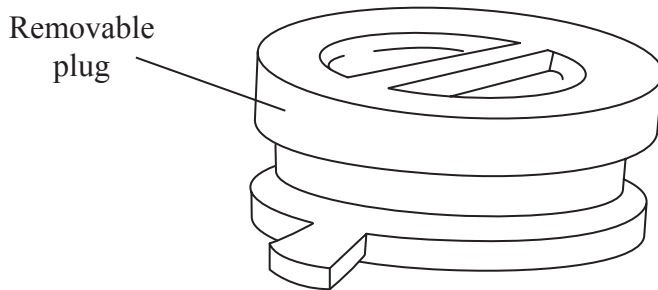
- (b) The main body of the bird feeder is made from pine.  
One reason for making the main body out of pine is that it can be treated with a preservative.

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.

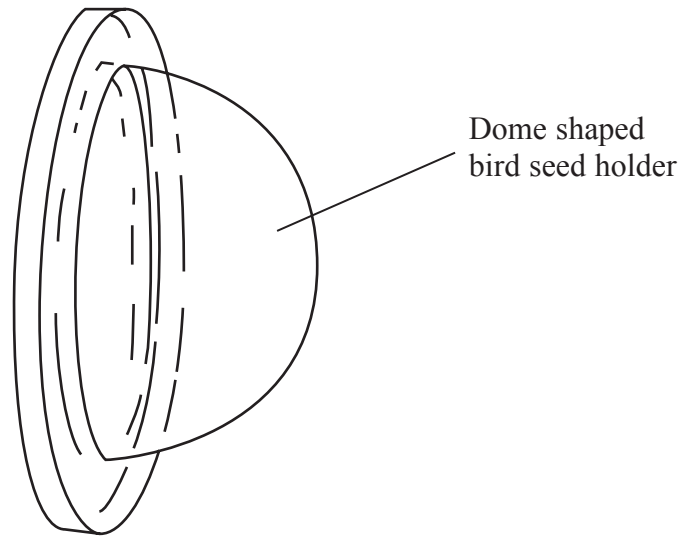


Give **two** reasons why injection moulding is a suitable process to manufacture the removable plug.

- 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)**

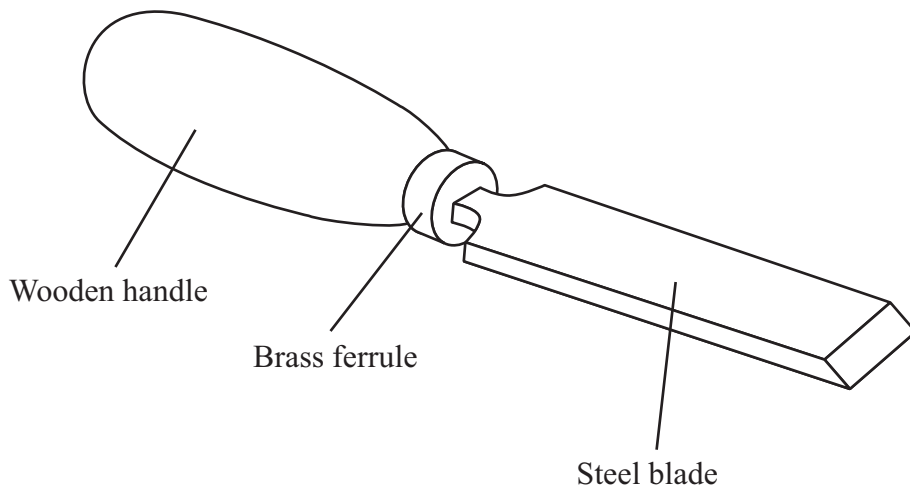
**(Total 22 marks)**

**Q1**

--	--



2. The drawing below shows a chisel.



(a) A chisel must always be used safely.

Give **three** health and safety related risks associated with using the chisel in a school workshop.

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

(b) The ferrule is made out of brass, an alloy.

Name the **two** metals used to make brass.

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

(c) The steel blade is hardened in order to improve its ability to cut.

Describe **one** way to harden the steel blade.

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



- (d) The handle for the chisel could also be made from plastic.  
The plastic handle would be made by using the injection moulding process.

Explain **two** advantages of producing the handle using the injection moulding process.

1 .....

.....

.....

2 .....

.....

.....

**(4)**

- (e) A new handle for the chisel is to be designed using CAD.

Give **three** ways in which CAD can be used when designing a new handle for the chisel.

1 .....

2 .....

3 .....

**(3)**

- (f) (i) Manufacturers use ICT to help manage their businesses.

Describe **two** ways in which manufacturers use ICT to help manage their businesses.

1 .....

.....

.....

2 .....

.....

.....

**(4)**





(ii) Computer Integrated Manufacture (CIM) is used to make the new handles in high volume.

Explain **two** advantages, to the manufacturer, of using CIM to make the new handles in high volume.

1 .....

.....

.....

2 .....

.....

.....

(4)

Q2

(Total 22 marks)



3. A company is designing a storage unit for the hallway in a house.

The specification for the storage unit for the hallway is that it must:

- provide a method to hang up two coats that allows them to be individually removed
- store two pairs of shoes without being able to see them
- be flat packed and assembled using only a screwdriver
- be made using materials and processes suitable for batch production.

#### ADDITIONAL INFORMATION



All dimensions in mm

- (a) In the spaces opposite, use sketches and, where necessary, brief notes to show **two different** design ideas for the hallway storage unit 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)**

---

**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 hallway storage system must provide a method to hang up two coats that allows them to be individually removed.

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

**(2)**

(ii) The hallway storage unit must store two pairs of shoes without being able to see them.

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

**(2)**

(iii) The hallway storage unit must be flat packed and assembled using only a screwdriver.

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

**(2)**

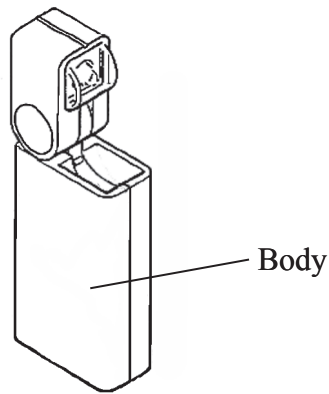
**(Total 22 marks)**

**Q3**

--	--



4. The drawing below shows a flip top torch.



(a) The body of the flip top torch is made from ABS.

Give **two** properties of ABS.

For each property give a reason that makes it suitable for the body.

Property 1 .....

Reason .....

.....

.....

Property 2 .....

Reason .....

.....

.....

(4)

(b) ABS is a thermoplastic.

Give **three** working characteristics of thermoplastics.

1 .....

2 .....

3 .....

(3)



(c) Acrylic was considered for the manufacture of the body of the flip top torch.

Explain **one** disadvantage of using acrylic for the body rather than ABS.

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

**(2)**

(d) Copper, a non-ferrous metal, is used to make the electrical contacts inside the flip top torch.

Explain **one** reason why copper is used, instead of a ferrous metal, for the electrical contacts inside the torch.

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

**(2)**

(e) The manufacturer of the flip top torch decides to use recycled materials for the packaging.

Give **three** advantages to the environment of using recycled materials for the packaging.

1 .....  
2 .....  
3 .....

**(3)**



(f) The flip top torch uses batteries which can be recharged.

Describe **two** benefits to the environment of using a torch with batteries that can be recharged.

1 .....

.....

.....

2 .....

.....

.....

(4)

(g) Each year thousands of items are **not** being recycled.

Explain **two** reasons why items are **not** being recycled.

1 .....

.....

.....

2 .....

.....

.....

(4)

Q4

(Total 22 marks)

**TOTAL FOR PAPER: 88 MARKS**

**END**



**BLANK PAGE**

