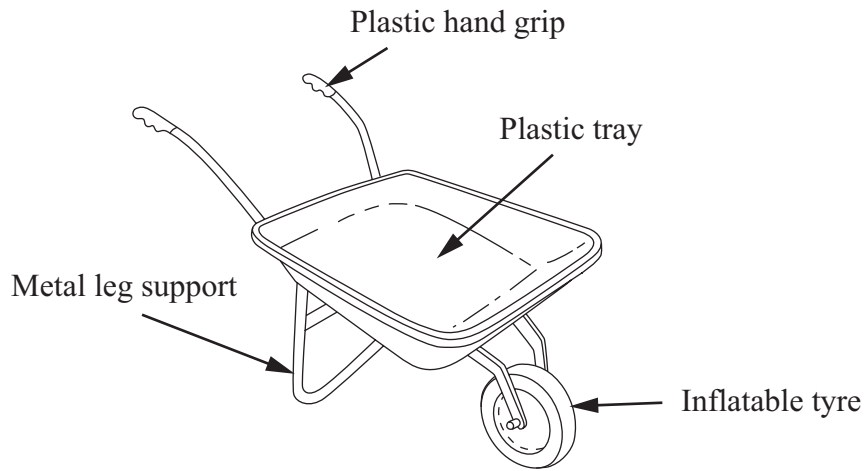




**Answer ALL the questions. Write your answers in the spaces provided below.**

1. The drawing below shows a wheelbarrow.

It is sold in do-it-yourself (DIY) stores.



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

- carry heavy loads
- go over rough, wet ground.

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

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

(i) **Quality**

Point .....

Reason .....

.....

(2)

(ii) **Environment**

Point .....

Reason .....

.....

(2)

(iii) **Safety**

Point .....

Reason .....

.....

(2)

(b) The leg support is made from mild steel tube.

One reason for making the leg support out of mild steel tube is that it can be easily joined by welding.

Give **two** other reasons why mild steel tube is a suitable material from which to make the leg support.

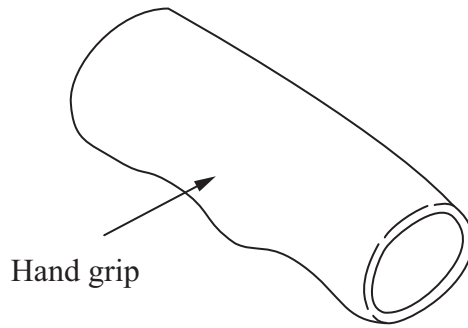
1 .....

2 .....

(2)



(c) The plastic hand grip is manufactured using the injection moulding process.



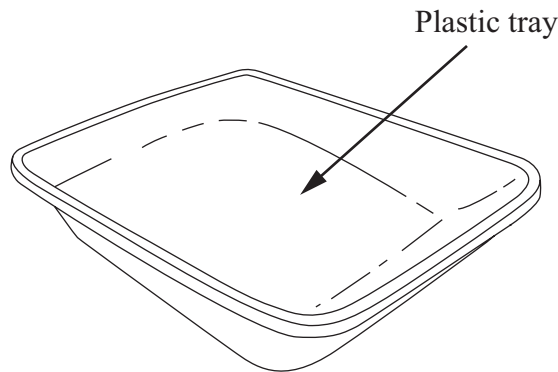
Give **two** reasons why the injection moulding process is suitable to manufacture the plastic hand grip.

1 .....

2 .....

(2)

(d) The plastic tray is made from ABS.



Give **two** properties of ABS that make it suitable for the tray.

For each property give **one** reason why it makes ABS suitable for the tray.

Property 1 .....

Reason .....

.....

Property 2 .....

Reason .....

.....

(4)



(e) The manufacturer of the wheelbarrow uses sampling during production.

Explain **one** reason for using sampling during the manufacture of the wheelbarrow.

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

(f) The leg support is painted.

Explain **one** reason why the leg support is painted.

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

(g) Two purposes of the wheelbarrow are to:

- carry heavy loads
- go over rough, wet ground.

Explain, under the following headings, how the wheelbarrow achieves these purposes.

(i) Carry heavy loads.

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

(ii) Go over rough, wet ground.

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

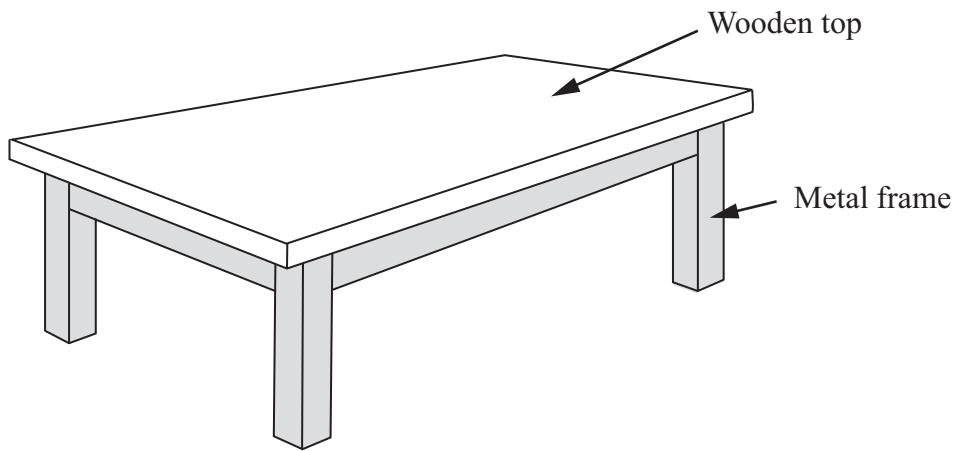
**(Total 22 marks)**

**Q1**

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2. The drawing below shows a coffee table.



(a) The metal frame of the coffee table has been welded together.

Give **three** risks associated with welding.

1 .....

2 .....

3 .....

(3)

(b) The wooden table top has been finished with a clear varnish.

Complete the table below to show the remaining **four** main stages involved in applying a finish of clear varnish to a wooden table top.

One mark is awarded for the correct sequence.

Some stages have been done for you.

Stage	Process
1	Rub down surface with glass paper
2	
3	
4	Let it dry
5	
6	

(5)



(c) Give **one** finish, other than varnish or paint, that could be applied to the wooden table top.

..... (1)

(d) Explain **one** reason for finishing the wooden table top with a clear varnish.

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

(e) The coffee table is manufactured in batches.

Describe **two** reasons why the coffee table is manufactured in batches.

1 .....  
.....  
2 .....  
..... (4)

(f) A new coffee table is to be designed using CAD.

Give **three** benefits for the designer of using CAD when designing a new coffee table.

1 .....  
2 .....  
3 ..... (3)

(g) The manufacturer of the coffee table sells to many retail outlets.

Describe **two** ways in which a computerised system could help the manufacturer to manage its business.

1 .....  
.....  
2 ..... (4)

(Total 22 marks)

Q2

--	--



3. A company is designing a chair for outdoor use.

The specification for the outdoor chair is that it must:

- be portable and foldable
  - provide a stable seating platform to sit on
  - have a backrest which is adjustable
  - be made using materials and processes suitable for batch production.
- (a) In the spaces opposite, use sketches and, where necessary, brief notes to show **two different** design ideas for the **outdoor chair** 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 outdoor chair must be portable and foldable.

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

(2)

(ii) The outdoor chair must provide a stable seating platform to sit on.

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

(2)

(iii) The outdoor chair must have a backrest which is adjustable.

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

(2)

**(Total 22 marks)**

**Q3**

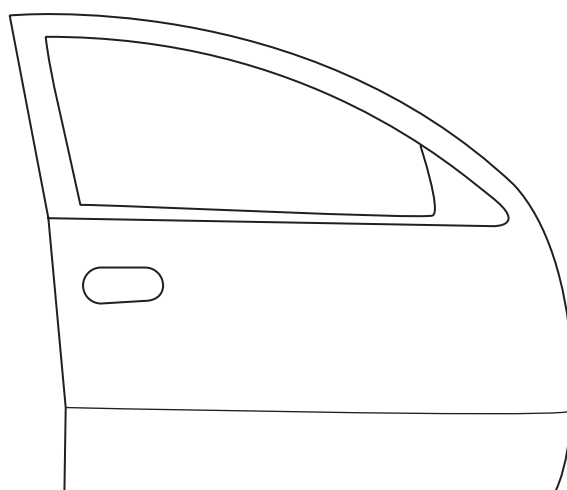
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4. The drawing below shows a car door panel.



(a) The car door panel is made from mild steel.

Give **two** properties of mild steel that make it a suitable material for the car door panel.

For each property give **one** reason why it makes mild steel suitable.

Property 1 .....

Reason .....

.....

Property 2 .....

Reason .....

.....

(4)

(b) Mild steel is a ferrous metal.

Give **three** working characteristics of ferrous metals.

1 .....

2 .....

3 .....

(3)



(c) Aluminium was considered for the manufacture of the car door panel.

Explain **one** disadvantage of using aluminium for the car door panel rather than mild steel.

.....  
.....

(2)

(d) Carbon fibres are used for body panels on racing cars.

Explain **one** reason why carbon fibres are used for body panels on racing cars.

.....  
.....

(2)

(e) New cars are designed to contain parts that can be recycled once they reach the end of their useful working life.

Give **three** benefits to the environment of new cars containing parts that can be recycled when they reach the end of their useful working life.

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

(3)

(f) Fuel consumption is a critical environmental consideration for car designers today.

Describe **two** benefits to the environment of reducing fuel consumption.

1 .....  
.....  
2 .....  
.....

(4)



(g) Moral implications play an important part in the design of new cars.

Many cars are designed with planned product obsolescence.

Explain **two** reasons why manufacturers choose to include built-in obsolescence in their cars.

1 .....

.....

2 .....

.....

(4)

Q4

(Total 22 marks)

**TOTAL FOR PAPER: 88 MARKS**

**END**



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