

Design & Technology

A-Level

Moulding

Multiple Choice

Materials required for questions

- Pencil
- Rubber
- Calculator

Instructions

- Use black ink or ball-point pen
- Try answer all questions
- Use the space provided to answer questions
- Calculators can be used if necessary
- Use a cross in the box to mark you answer

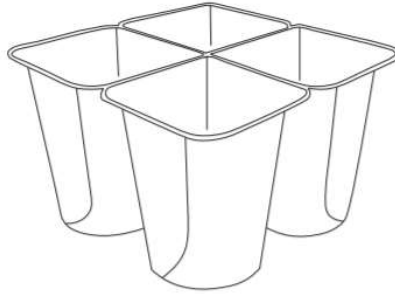


Advice

- Marks for each question are in brackets
- Read each question fully
- Try to answer every question
- Don't spend too much time on one question

Good luck!

Q1. Which one of the following processes would be used to manufacture yoghurt pots?



A Injection moulding

☐

B Vacuum forming

☐

C Blow moulding

☐

Q2. Which one of the following processes would be used to manufacture continuous lengths of plastic pipe?

A Extrusion

☐

B Injection moulding

☐

C Blow moulding

☐

Q3. Which process would have been used to make the metal frame of the g-clamp shown below?



A Injection moulding

☐

B Casting

☐

C Blow moulding

☐

Q4. Which one of the following processes is best suited to manufacture a hollow shampoo bottle?

A Vacuum forming

☐

B Blow moulding

☐

C Extrusion

☐

Q5. Which one of the following processes involves the use of heat?

A Laminating

☐

B Pop riveting

☐

C Vacuum forming

☐

Q6. When injection moulding, how is the polymer moved along the heating chamber?

- A** By a belt
- B** By the heater
- C** By an Archimedean screw

☐☐☐

Q7. What is a former?

- A** A rigid shape that is used so other materials take its form
- B** A hollow cavity where molten material can be formed
- C** A hollow shape produced on a vacuum former

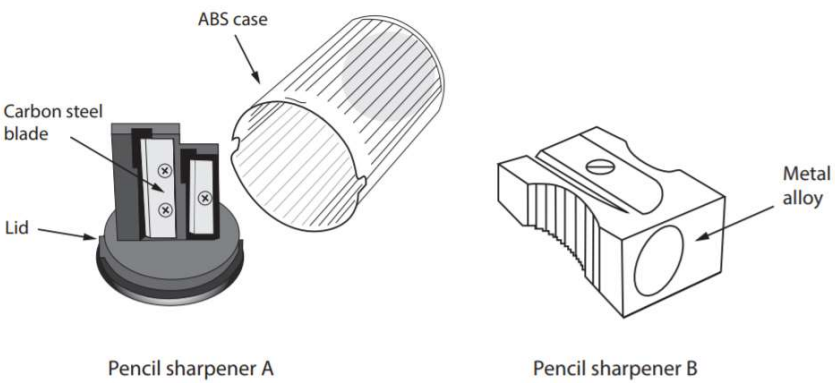
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Q8. Which of the following is the process called injection moulding?

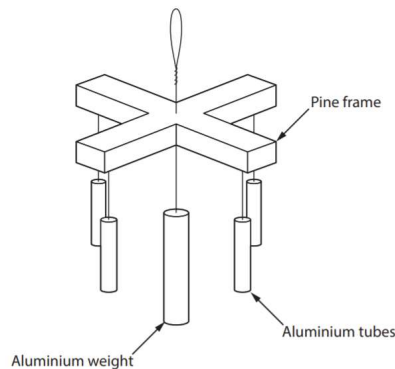
- A** Plastic coating of a metal surface, to increase its resistance to temperature
- B** A process involving heating plastic granules to liquid form and forcing the solution into a mould
- C** A process that creates a reflective coating on a range of polymers

☐☐☐

Q9. The images below show 2 different types of pencil sharpener
Evaluate pencil sharpener A in comparison to pencil sharpener B in
terms of form, materials and components. **(6 marks)**



Q10. The drawing below shows a wind chime. It hangs from a tree in the garden and makes a gentle noise when blown in the wind. **(2 marks)**

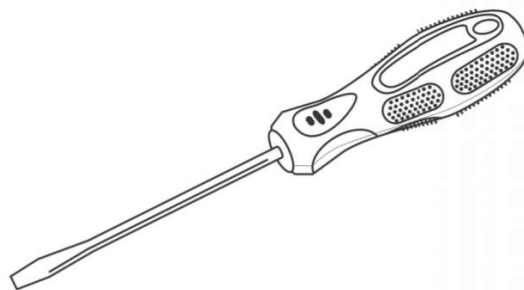


Give two properties of aluminium that make it suitable for the weight.

1.

2.

Q11. The drawing below shows a screwdriver.



Give 2 properties of polyethene that make it suitable for the screwdriver handle.

For each property justify your answer. **(4 marks)**

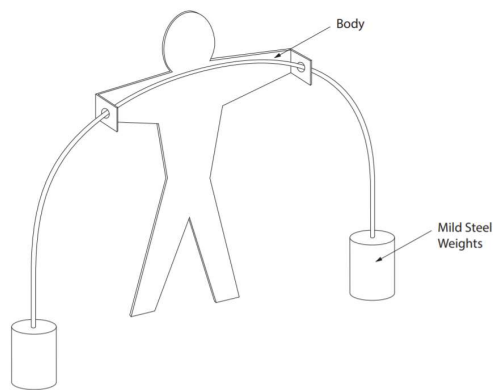
Property 1:

Justification:

Property 2:

Justification:

Q12. A body of the balancing figure could be made from acrylic or aluminium.



Give three advantages of making the body out of acrylic rather than aluminium. **(3 marks)**

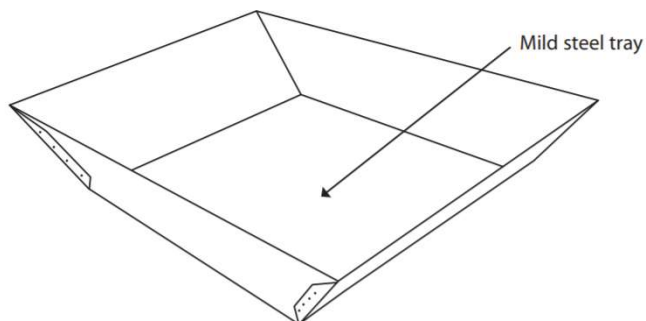
1.

2.

3.

Q13. Thermochromic pigments have many innovative applications.

The wheelbarrow tray is made from mild steel



Explain 2 advantages of making the wheel barrow tray from mild steel **(4 marks)**

1.

2.

Q14a. The shaped blocks shown below are made from polyvinyl chloride (PVC).

Give two properties of PVC that make it suitable for the shaped blocks. Justify your answer for each property **(4 marks)**

Property 1:

Justification:

Property 2:

Justification:

14b. The shaped blocks are hollow. Name one process that could be used to make the hollow shaped blocks. **(1 mark)**

Answers

Q1. B

Q2. A

Q3. B

Q4. B

Q5. C

Q6. C

Q7. A

Q8. B

Q9.

Evaluation to address following issues:

Why is product shaped/styled the way it is?

Pencil sharpener A:

- Big to hold and collect waste
- Able to be taken apart easily so as to be able to empty the ABS case
- Textured ribs moulded into the case
- Two different sized holes to enable different sized diameter pencils to be sharpened
- Bigger and takes up more space

Pencil sharpener B:

- Textured grip on the side to make it easier to hold
- Clear space around the top by the blade to allow shavings to be removed as they come off the pencil
- Has finger and thumb recesses to enable a secure grip
- Tapered shape follows the form of the conical pencil tip
- Smaller than A but likely to get lost

Materials and components

Pencil sharpener A:

- Could have a clear / transparent waste collection unit so as to see when it is full
- Blades that can be replaced when they are blunt
- Injection moulded components can be coloured at the manufacturing stage
- Multiple materials
- ABS case prone to cracking

Pencil sharpener B:

- Low melting alloy for die casting
- Fine detail moulded into product as a result of material and process

- Replaceable blade
- Self-finishing as a result of the process used
- Single material
- Robust / unlikely to break

Q10.

Two properties given from:

- Excellent resistance to corrosion/oxidises to protect/water resistant/does not rust (1)
- Light/lightweight (1)
- Durable (1)
- Maintains/keeps high shine/lustre (1)
- Free cutting/good machinability (1)
- Fluidity/Can be extruded (1)

2 x 1

Q11.

Two properties given and linked justification from:

Property: Tough (1)

Justification: It can withstand knocks / being dropped / hit with hammer (1)

Property: Electrical insulator (1)

Justification: It will protect from electric shocks (1)

Property: Plasticity (1)

Justification: It can be injection moulded / easily moulded (1)

Property: Lightweight (1)

Justification: So it can be used for long periods without causing injury / RSI (1)

Property: Resistant to chemicals (1)

Justification: Will not be effected by any liquids / fluids / paints / white spirit (1)

2 x 1

2 x 1

Q12.

Two advantages given from:

- No surface finishing required (1)
- Acrylic is available in a range of colours (1)
- Acrylic is lighter (1)
- Easily cut on a laser (1)
- Acrylic is easily heated and bent into shape/ moulded/ formed (1)

(Do not accept cheaper or anything related to recycling)

3 x 1

Q13.

Two advantages explained from:

- No expensive mould/machine is required (1) which means that it will be cheaper (1)
- Easy to recycle (1) which means less likely to be thrown away/added to landfill (1)
- Easy to make different shapes and sizes (1) because there is no mould (1)
- Bits can be pressed/stamped out (1) and then joined easily by welding/riveting (1)
- Mild steel is tough (1) which means it can withstand knocks / bumps(1)
- Mild steel is hard (1) which means it can withstand wear (1)
- Easily welded (1) can be repaired/patched up (1)
- High compressive strength (1) makes it capable of taking/carrying weight (1)
- Relatively cheap (1) keeps material costs down (1)
- Widely/readily available (1) making is easy to get (1)
- Malleable (1) which means it can be pressed/folded into shape (1)

Do not accept 'Strong' or 'Durable'.

2 x 1

2 x 1

Q14a.

Property

- Durable (1)

Justification

- Means they can be left outside and will not fade/discolour in the sunlight (1)

Property

- Waterproof (1)

Justification

- Means they can be left outside and will not absorb water/ can be put in a child's mouth/can be wiped clean (1)

Property

- Tough/impact resistant (1)

Justification

- Means they can withstand knocks and bumps when being used (1)

Property

- Lightweight (1)

Justification

- Means they are not too heavy for children to play with/will not hurt them if they drop it (1)

Property

- Good chemical resistance (1)

Justification

- Means they can be washed with detergents (1)

Property

- Plasticity (1)

Justification

- Means it can be moulded/blown into shape (1)

Justification must be focused on the product rather than generic qualities.

2 x 1

2 x 1

14b.

Any named process from:

- Blow moulding (1)
- Rotational moulding (1)