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Design & Technology AQA A-Level

Metal finishing

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
- For the multiple choice questions, circle your 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

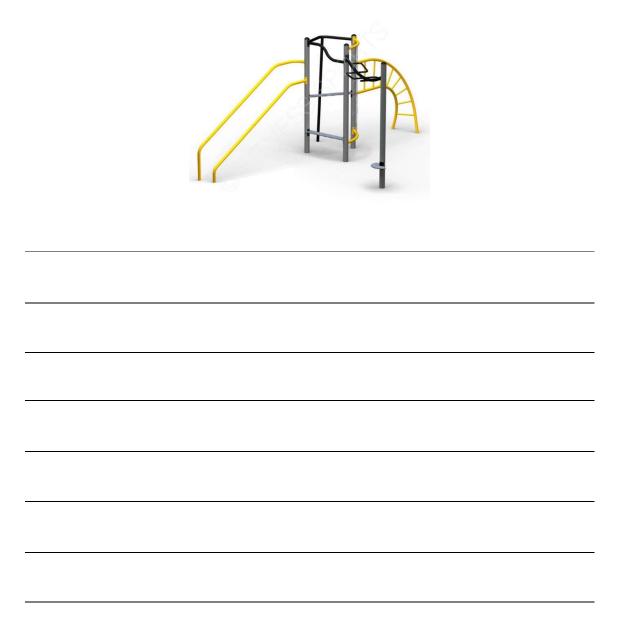
Good luck!

	nich metal finish involves applying a liquid paint that hardens upon re to air?
Α	Powder coating
В	Cellulose paint
С	Electro-plating
Q2. Wł	nat is the purpose of galvanising a metal?
Α	To make it more flexible
В	To prevent corrosion by applying a zinc layer
С	To give it a shiny appearance
Q3. Wh	nich finishing process uses an electric current to deposit a metal 3?
Α	Dip coating
В	Powder coating
С	Electro-plating
Q4. Wh	nat is the main purpose of using sealants on metals?
Α	To provide a waterproof barrier
В	To increase electrical conductivity
С	To change the metal's colour

6. Explain why galvanising is an appropriate finish for the low carbon steel affold shown below (6 marks)	25. Explain why anodisir narks	ng is an appropriate finish for an aluminium torch (6

Q7. Give t	hree reasons why a product may have an anodised finish (3 marks)
1.	
2.	
3.	

Q8. Explain why powder coating is an appropriate finish for the climbing frame shown below **(6 marks)**



Answers

Q1. B

Q2. B

Q3. C

Q4. A

Q5.

- The anodising enhances the natural oxide layer of the aluminium, increasing its hardness and toughness, allowing for the torch to resist scratching and wear associated with storage and use.
- The anodising process allows for a pigment or colour to be used which enhances the aesthetic of the torch.
- An anodised finish can be laser etched to allow the text and logos to be added to the torch, using the natural colour of the aluminium to provide clear contrast.
- Anodising protects the aluminium from further corrosion or oxidisation.
- Anodising is an electroplating process which ensures that all surfaces of the components of the torch are evenly anodised.
- The thickness of the anodised coating is minimal which therefore doesn't affect any threaded components, or interfere with the knurled surface of the torch handle.
- The anodised finish is tough and hardwearing, requiring no maintenance during the lifespan of the torch.

Q6.

- The scaffold is a functional object, where aesthetics are not as important as function therefore the inconsistent galvanised patterned finish causes no issue.
- Galvanising protects the low carbon steel from corrosion. The galvanising process is hardwearing so will resist the scratching likely to occur from assembly, storage and transportation.
- The cathodic protective nature of galvanising means that the scaffold would continue to be protected even if damage did occur.
- The dip coating nature of galvanising means that the hollow steel structure of the scaffold is protected on all surfaces.
- Galvanising provides a zinc protective layer to the low carbon steel which provides cathodic protection for the base metal.

 Galvanising provides a surface finish that requires little or no maintenance allowing for extend use and reducing any ongoing costs to the scaffold user.

Q7.

- Anodising can increase the resistance to corrosion.
- Anodising can be used to add a pigment, colour, or decorative surface finish.
- Anodising increases the hardness of the aluminium product's surface.
- Anodising increases the toughness of the aluminium product's surface.
- Anodising can increase the resistance to wear when in contact with other materials

Q8.

- Powder coating provides a hard, durable finish which will resist the wear from children's shoes.
- Thicker coats can be achieved than feasible with liquid paint finishes.
- A wide range of colours are available, as pigments can be added.
- Powder coating will protect the frame from oxidising.
- Powder coating gives an even coat of material around cylindrical shapes.
- Overspray from the climbing frame can be recycled and reused.
- Powder coated finishes are less prone to fading from UV degradation due to the use of stabilisers.
- Powder coated finishes are less likely to chip than traditional paint finishes.
- Powder coated finishes are not affected by extremes of temperature found outdoors during summers and winters.