Design & Technology

Finishing techniques

Materials required for questions

- Pencil
- Rubber
- Calculator

Instructions

- Use black ink or ball-point pen
- Try to 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
- Don’t spend too much time on one question

Good luck!

Q1. Which one of the following materials needs to have a surface finish applied if it is to be used outside?

A Aluminium

B Copper

C Oak

Q2. When applying a surface finish, what is key?

A A smooth surface to paint on

B A rough surface to paint on

C A clean surface to paint on

Q3. What is an alloy?

A A mixture of 2 or more elements, where at least 1 is a metal

B A mixture of 3 or more elements, where at least 1 is a metal

C A compound of 2 or more elements, where at least 1 element is a metal

Q4. Which one of the following finishes is best applied to a mild steel hanging plant basket?

A Stain

B Plastic dip coating

C Varnish

Q5. Which of the following finishes is used for woods?

A Shellac

B Chemical lacking

C Anodising

Q6. Which of the following finishes is used on aluminium?

A Anodising

B Galvanising

C Electroplating

Q7. Which of the following is the process called etching?

A A process whereby paint is sprayed onto the surface of a material

B A process that creates a long-lasting protective coating on a metal

C Acid is used to remove the unprotected surface of a metal for a decorative finish

Q8. Which one of the following processes involves dipping a metal into molten zinc?

A Galvanising

B Cathodic protection

C Electroplating

Q9a. Explain why surface finishes are applied to materials and fabrics for aesthetic reasons. Give examples in your answer **(3 marks)**

9b. Explain why surface finishes are applied to materials and fabrics for functional reasons. Give examples in your answer **(3 marks)**

Q10a. Name **two** appropriate finishes that could be applied to mild steel **(2 marks)**

1.

2.

10b. Explain **two** reasons for applying a finish to the mild steel sheet **(4 marks)**

1.

2.

Q11. Explain **two** advantages of adonising in preference to painting **(4 marks)**

1.

2.

Q12. The steel handles of a desk drawer have been electro-plated with brass. Explain **two** reasons why the handles would be electro-plated with brass **(4 marks)**

1.

2.

Q13. Name **two** paper and board finishing processes that could be used to improve the aesthetics of packaging for a toy **(2 marks)**

1.

2.

Q14. A children's climbing frame has been finished with a powder coating. Explain why powder coating is an appropriate finish **(6 marks)**

Answers

Q1. A
Q2. B
Q3. C
Q4. B
Q5. A
Q6. A
Q7. C
Q8. A

Q9a.

Any named aesthetic reason:

- Change the colour of a product (1)
- Improving appearance/make the product look more attractive (1)
- Change the look and feel of a product (1)

Aesthetic finish examples:

- Painting cars different colours to suit different customer tastes (1)
- Embossing in card to create a decorative 3D effect (1)
- Self-finished surface, e.g. the injection moulding process can 'build in' a textured surface in contrast to a smooth surface (1)
- Add to decoration and quality of finish, e.g. enamelling jewellery
- Wood stains to enhance the colour of timber (1)
- Anodising to produce brightly coloured aluminium products, e.g. bike wheels, Maglites (1)
- Stonewashing jeans (distressing) gives a soft peach skin effect (1)
- Heat setting thermoplastic fibres to give crushed effect, creases and pleating (1)

Q9b.

- To make more suited to intended use/improve durability (1)
- To inhibit combustion/reduce fire risk (textiles) (1)
- Protect from moisture/water (1)
- Stain resist finish (1)
- To prevent insect/fungal attack (wood) (1)
- To resist corrosion (1)
- Build in a textured finish (polymers) (1)
- Provide a non-slip finish (1)

- Flame retardants to textiles (1)
- Waterproof finish on a jacket (1)
- Laminating a book cover to protect from moisture (1)
- Anodising aluminium to improve durability (1)
- Electro plating to provide a durable finish (1)
- Wood preservative on a garden fence to protect from moisture and insect attack (1)
- Dip/powder coating of metals to inhibit corrosion (1)
- Galvanising (not aesthetic reason) mild steel to resist corrosion (1)
- Self-finished surface, e.g. injection moulding process can 'build in' a textured surface to provide a non-slip surface/grip on a chair, child's toy etc. (1)

Q10a.

Any **two** finishes from:

- Plastic dip coating / dip coating / plastic coating (1)
- Powder coating (1)
- Electroplating (1)
- Galvanising (1)
- Lacquer (1)

Do not accept 'painting' of any form.

10b.

Any **two** reasons explained from:

- It will make it look nicer (1) which will potentially increase sales (1)
- Mild steel will rust / develop a surface oxide (1) so any finish will protect it / make it last longer / more durable (1)
- Colours can be applied (1) therefore making it more visually appealing to children / users / increase sales (1)

Q11.

Any **two** of the following explanations that include identification of a benefit (1) and linked justifications of that benefit (1):

- Durable / lasts a long time (1) does not fade / so will not flake / peel / chip / so does not need repeating / recoating (1)
- More scratch resistant (1) as it penetrates into the surface / add a harder layer to the surface (1)
- Negligible thickness (1) so holes do not get clogged / do not need cleaning out / does not prevent it functioning / more accurate tolerances possible (1)
- Fully covers every surface (1) as anodising fluids fully penetrate holes (1)

Q12.

Any **two** of the following explanations that include a correct reason (1) and linked justifications of that reason (1):

- To improve the aesthetics / makes the desk more appealing (1) so that it sells more (1)
- To prevent corrosion (1) resulting from moisture on skin / moisture / oxygen in the air (1)
- Because it is a durable finish (1) it will not flake, peel or chip over time / so the handle will retain its good aesthetics (1)
- Cost effective finish (1) for the economic / low priced market (1)

Q13.

Any **two** from:

- Varnishing / spot varnishing (1)
- Hot foil blocking (1)
- Embossing (1)
- Debossing (1)
- Laminating (1)

Q14.

- Powder coating provides a hard, durable finish which will resist the wear from children's shoes (1)
- Thicker coats can be achieved than feasible with liquid paint finishes (1)
- A wide range of colours are available, as pigments can be added (1)
- Powder coating will protect the frame from oxidising (1)
- Powder coating gives an even coat of material around cylindrical shapes (1)
- Overspray from the climbing frame can be recycled and reused (1)
- Powder coated finished are less prone to fading from UV degradation due to the use of stabilisers (1)
- Powder coated finishes are less likely to chip than traditional paint finishes (1)
- Powder coated finishes are not affected by extremes of temperature found outdoors during summers and winters (1)