DTBase©

Design & Technology
Edexcel GCSE

Fibres

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!

Q1. Which one of the following is a natural fibre that comes from an animal?

A Cotton

B Wool

C Polyester

Q2. What are synthetic fibres made from?

A Chemicals from crude oil

B Plants

C Animal hair

Q3. Which synthetic fibre feels like wool and is often used as a cheaper, non-allergenic alternative to it?

A Acrylic

B Cotton

C Polyester

Q4. Which property describes a fabric that can stretch and then return to its original shape?

A Durability

B Resilience

C Elasticity

Q5. Which property describes a fabric that springs back after being crushed, so it resists creasing?

A Resilience

B Absorbency

C Elasticity

Q6. What is a blended fabric?

A Two or more different fibres spun together into one yarn

B A fabric made only from natural fibres

C Two layers of fabric glued together

Q7. For each of the products below, give a property of the material it is made from that makes the material suitable for the product.

Q7a. Polyester raincoat. **(1 mark)**

Q7b. Wool scarf. **(1 mark)**

Q7c. Cotton bath towel. **(1 mark)**

Q8. A school tie is made from polyester. An advantage of using polyester for the school tie is that it is crease resistant.

Explain one other advantage of using polyester for the school tie. **(2 marks)**

Q9. A laptop bag is made from polyester.

Q9a. Explain one working property of polyester that makes it an appropriate choice of material to make the laptop bag. **(2 marks)**

The material for the laptop bag is 60% new polyester and the rest is recycled polyester. The laptop bag requires 320 grams of polyester in total.

Q9b. Calculate how many grams of recycled polyester are required for the laptop bag. **(2 marks)**

Q10. A school jumper is made from weft knitted acrylic fabric. Making school jumpers from acrylic fabric is cost effective.

Explain one other benefit of manufacturing the fabric of the school jumper from acrylic fibres. **(2 marks)**

Q11. A uniform that some nurses wear in hospitals is made from a woven cotton fabric.

Explain two characteristics of cotton that make it an ideal fibre to use and make into the uniform. **(4 marks)**

1

2

Q12. A pair of walking trousers is made from plain woven polyester fabric.

Explain two reasons for using polyester fibres for the fabric of the walking trousers. **(4 marks)**

1

2

Q13. Fabrics are made from either synthetic or natural fibres.

Q13a. Name one example of a synthetic fibre and one example of a natural fibre. **(2 marks)**

Synthetic

Natural

Q13b. Synthetic fibres can be blended with natural fibres. Describe one advantage of fibre blending. **(2 marks)**

Q14. Give two reasons why blended and mixed fibres are used in clothing. **(2 marks)**

1

2

Answers

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

Q7a.

Any one property (1 mark): water resistant/waterproof/weather resistant; durable; crease/stain/abrasion resistant; resistant to mildew/bacteria; fibres have high tensile strength.

Q7b.

Any one property (1 mark): warm/traps air/insulator; breathable; durable; soft.

Q7c.

Any one property (1 mark): soft/softness; absorbent/absorbs water; insulator of heat/thermal insulator.

Q8.

Any one advantage (1 mark) and a linked justification (1 mark):

- It is stain resistant (1), so it will not mark/stain if food or drink gets spilt on it (1)
- It hangs/drapes well (1), which means it will look presentable when worn/tied (1)
- It dries quickly (1), so it can be washed overnight and be ready for school the next day (1)
- It is resistant to abrasion (1), which means it will not get damaged if it rubs on a blazer/desk (1)
- It does not shrink (1), therefore it will not lose its shape when it gets washed/wet (1)
- Polyester has good colour retention (1), so the colour will not fade (1)

Q9a.

Any one working property (1 mark) and a linked justification (1 mark):

- Polyester is waterproof/shrink resistant (1), which means it will protect the laptop inside from rain/liquids (1)
- Polyester has good tensile strength (1), which means the strap/bag will support the weight of the laptop (1)
- Polyester is durable (1), which means it will resist wear as the bag rubs against the user's clothes (1)
- Polyester is stain/chemical resistant (1), which means it will not be affected by liquids/coffee spilt on it (1)
- Polyester is stretch resistant (1), which means it will not change shape due to the weight of the laptop (1)

Q9b.

- Recycled polyester: 100% − 60% = 40% (1)
- 40 ÷ 100 × 320 = 128 grams (1)
- Award full marks for the correct answer without working.

Q10.

Any one benefit (1 mark) and a linked justification (1 mark):

- Acrylic fibres can be dyed in a wide variety of colours (1), so the jumper can suit most school uniforms (1)
- Acrylic is non-allergenic (1), so it is suitable for more wearers than wool (1)
- Acrylic fibres are easy care (1), so they suit a school uniform that is washed often (1)
- Acrylic fibres do not shrink (1), so the jumper will look the same after washing (1)
- Acrylic fibres are crease resistant (1), so the jumper will not need ironing before being worn (1)
- Acrylic fibres are durable (1), so they suit a garment worn every day (1)
- Acrylic fibres are colourfast (1), so they keep their colour when washed (1)

Q11.

Any two characteristics (1 mark each) and a linked justification of each (1 mark each), up to 4 marks:

- Cotton is absorbent (1), so it will absorb sweat (1)
- Cotton can be washed at high temperatures (1), which will make the uniform more hygienic (1)
- Cotton can withstand biological detergents/bleach (1), which means stains such as blood can be removed (1)
- Cotton is a breathable fibre (1), so it will keep the wearer comfortable at work (1)
- Cotton is a durable fibre (1), which means the uniform can withstand lots of wear and tear on a busy shift (1)

Q12.

Any two reasons (1 mark each) and a linked justification of each (1 mark each), up to 4 marks:

- Polyester fibres have high tensile strength (1), therefore they keep their shape when being worn (1)
- Polyester fibres have good durability (1), therefore they resist wear and tear when being worn (1)
- Polyester fibres have some water resistance (1), therefore they are suitable for walking in the wet (1)
- Polyester fibres are lightweight (1), therefore the walker is less likely to get tired/they are easier to walk in (1)
- Polyester fibres have some elasticity (1), therefore they do not crease when being worn (1)
- Polyester fibres can be made very smooth (1), which is comfortable next to the skin (1)
- Polyester fibres can be made in a wide variety of colours (1), so they can suit all tastes (1)

Q13a.

1 mark for each correct example. Synthetic: polyester, acrylic, nylon (polyamide), elastane (Lycra). Natural: wool, cotton, linen, silk.

Q13b.

1 mark for an advantage and 1 mark for the description/example:

- It can improve the properties of the fabric (1), e.g. the fabric becomes more crease resistant (1)
- It can improve the look/texture of the fabric (1), e.g. the fabric can have more shine (1)
- It can reduce the cost of the fabric (1), e.g. polyester is cheaper than cotton (1)
- It can improve the quality of the fabric (1), e.g. the fabric becomes stronger (1)

Q14.

1 mark for each correct reason, up to 2 marks:

- To produce fabrics with more desirable/enhanced properties
- To improve durability, e.g. polycotton (polyester and cotton)
- To make the fabric easier to care for
- To make clothing less likely to shrink or crease
- To produce clothing more cheaply, e.g. polycotton is cheaper than pure cotton
- Adding cotton to a synthetic fibre makes it more breathable, so more comfortable to wear