Design & Technology
(Product Design)

DTBase©

OCR A-Level

Natural and Synthetic Fibres (5.2avi)

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 of the following is not a natural fibre?

A Cotton

B Silk

C Nylon

Q2. What is the main disadvantage of silk?

A It has poor insulation properties

B Its expensive

C It weakens when wet

Q3. What are polyester fibres used to make?

A Seatbelts

B Ball gowns

C Lycra

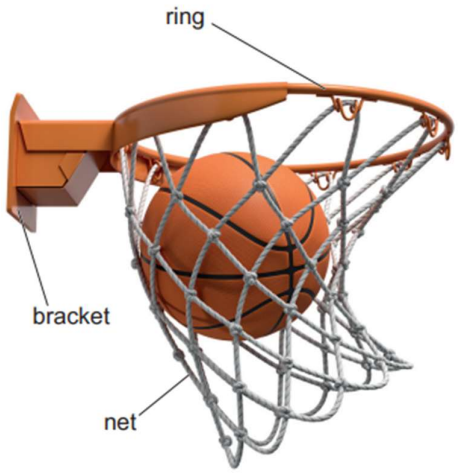
Q4. What sort of degradation usually effects synthetic fibres?

A Heat radiation

B Infrared radiation

C UV radiation

Q5. The image below shows a basketball hoop.



Q5a. Identify a suitable synthetic fibre for the net. **(1 mark)**

Q5b. Explain why a synthetic fibre has been used. **(2 marks)**

Q6. Explain one working property of polyester that makes it an appropriate choice of material to make the laptop bag. **(2 marks)**

Q7. State two properties of natural fibres that make them suitable for clothing. **(2 marks)**

Q8. Give two reasons why blended and mixed fibres are used in clothing. **(2 marks)**

Answers

Q1. C
Q2. A
Q3. A
Q4. C

Q5a.
Possible synthetic fibre may include:

- Nylon (1)
- Polyester (1)
- Polypropylene (1)
- Any other suitable response

Q5b.
Possible responses may include:

- Durable/ hardwearing over time/ long lasting (1) so it will withstand the constant impact of the ball (1).
- Will not degrade in UV light/ moisture/ water (1) as the hoop is likely to be used outside (1).
- Will be able to withstand rain wind/changes in temperature (1) without corroding/ degrading over time (1).
- Can be coloured in the manufacture to different colours (1) so could be coloured for a specific target market or team brand (1).
- The colour is in the pigment added to the material in manufacture (1) so will not fade or run if wet over time (1).
- Good elasticity (1) so if pulled will return to its original shape without warping (1)
- Resists attacks from moths/mildew/mould (1) unlike natural fibres (1).
- Any other suitable response.

Material properties that suit the product and situation are acceptable but must be related to the use of the net or its context for full marks to be awarded.

Q6.

- Polyester is waterproof / shrink resistant (1) which means it will protect the laptop inside from being damaged by the rain / liquids (1)
- Polyester has good tensile strength (1) which means the strap / bag will support the weight of the laptop inside (1)

- Polyester is a durable material (1) which means it will resist wear as the bag rubs against the clothes being worn by the user (1)
- Polyester is stain/chemical resistant (1) which means it will not be affected by any liquids / coffee spilt on it (1)
- Polyester is stretch resistant (1) which means it will not deform/change shape due to any loading/weight of the laptop inside (1)

Q7.
1 mark for each property correctly identified up to a maximum of 2 marks.

Indicative content:

Properties of natural fibres to make them suitable for clothing include:
- Thermal properties
- absorbency for dyeing
- soft handle
- good drape
- can be washed and ironed You should accept any other valid response.

Q8.
One mark for each correct reason why blended and mixed fibres are used in clothing.

Indicative content

Typical basic responses:
- to produce different fibres with more desirable/enhanced properties
- improve durability in the fibre
- make fabric easier to care for
- make clothing less likely to shrink or crease.

You may see more detailed responses:
- to produce different fibres with more desirable/enhanced properties, eg polyester can mitigate against shrinkage, creasing and slower drying speed
- make a yarn (blend of two or more fibres) to make a better product
- improve durability in the fibre, eg poly-cotton (polyester and cotton mix)
- produce clothing more cheaply, eg poly-cotton is a cheaper material than pure cotton

- use of cotton with a synthetic material makes it more breathable hence comfortable to wear
- fabrics can be heat-set, eg trousers with a crease, anti-crease fabrics
- similar appearance to natural materials, eg cotton, and can accept a print or dye easily. Accept all other valid responses.