

Properties of Materials

Warm-Up

Draw lines to match the properties listed on the left with their definitions.

Toughness	The ability to withstand scratching, abrasion or denting.
Hardness	A measure of the mass per unit volume of a material.
Density	The ability of a material to change shape instead of breaking or snapping.

1 Which **one** of the following describes a material's ability to be drawn into a wire?

- A Malleability
- B Fusibility
- C Ductility
- D Electrical conductivity

[1 mark]

2 Which **one** of the following statements is **not** true?

- A A spring needs to be elastic so it can return to its original shape after being stretched.
- B An electrical wire needs to be a good electrical insulator so electricity can travel through it easily.
- C A towel needs to be absorbent to soak up moisture.
- D A climbing rope needs to be strong so that it can hold the weight of a person without breaking.

[1 mark]

3 Saucepans are often made of metal. One of the reasons for this is that metals are good thermal conductors.

a) What is meant by thermal conductivity?

.....

[1 mark]

b) State two other general properties of metals that make them suitable for saucepans.

1.
 2.

[2 marks]

Score: / 5



Paper, Board and Timber

Warm-Up

Wood can be classified as a hardwood or softwood. Fill in the table below to sort the following types of wood into softwoods and hardwoods.

pine	oak
	balsa
beech	larch
	spruce
ash	mahogany

Softwood	Hardwood

1 What type of board is made up of expanded polystyrene sandwiched between two thin layers of card?

- A Corrugated cardboard
- B Solid white board
- C Duplex board
- D Foam core board

[1 mark]

2 A designer wants to make an accurate copy of a design drawing.

Which **one** of the following types of paper would most commonly be used for this purpose?

- A Isometric grid paper
- B Layout paper
- C Cartridge paper
- D Tracing paper

[1 mark]

3 State **one** property and **one** use for balsa wood.

Property:

Use:

[2 marks]

4 State **two** properties of oak that make it suitable for use in flooring.

1.

2.

[2 marks]

5 Hardwood has some different properties to softwood.

State **two** ways in which the physical or working properties of hardwood and softwood commonly differ.

- 1.
 - 2.
- [2 marks]

6 Larch is a wood that is often used as cladding to cover the outside of buildings.

Give another use of larch. State a property that makes it suitable for this purpose.

- Use:
- Property:
- [2 marks]

7 Which **one** of the following statements is **true**?

- A Ink jet card is designed to let the ink bleed when used with an ink jet printer.
 - B Solid white board is bleached white to make it suitable for printing on.
 - C Isometric grid paper has grid squares printed onto it to make it suitable for orthographic and scale drawings.
 - D Cartridge paper has a textured surface that can only be drawn on in pencil.
- [1 mark]

8 **Figure 1** shows a take-away food box.



Figure 1

a) Suggest a type of board that the box shown in **Figure 1** is made from.

.....
[1 mark]

b) Give a reason for your answer to part a).

.....
.....
[1 mark]

Score: / 13



Metals, Alloys and Polymers

1 Which **one** of the following statements about ferrous metals is **not** true?

- A Ferrous metals are mostly made up of iron.
- B Ferrous metals are not magnetic.
- C A protective coating is commonly applied to ferrous metals to prevent them from rusting.
- D Tool steel is a ferrous metal.

[1 mark]

2 Which **one** of the following is a type of ferrous metal?

- A Low carbon steel
- B Aluminium
- C Copper
- D Brass

[1 mark]

3 State **two** properties of copper that make it suitable for use in electrical wiring.

1.
2.

[2 marks]

4 **Figure 1** shows a brass tap. State **two** properties of brass that make it a suitable material for this purpose.

1.
2.

[2 marks]



Figure 1

5 High speed steel is an alloy that can be used to make high speed drill bits.

Explain why high speed steel is a suitable material for this purpose.

-
-
-

[2 marks]

6 Which **one** of the following is a type of thermoforming plastic?

- A Urea-formaldehyde
- B Acrylic
- C Melamine-formaldehyde
- D Polyester resin

[1 mark]

7 Which **one** of the following statements is **not** true?

- A Epoxy resin is rigid and corrosion-resistant.
- B Polyester resin is added to glass fibres to form glass-reinforced plastic.
- C Phenol-formaldehyde is heat-resistant, but hard to mould into different shapes.
- D High impact polystyrene is rigid and used for vacuum forming.

[1 mark]

8 Suggest a plastic that would be suitable for making each of the products shown in **Figures 2-4**. Give **one** reason for each answer.



Figure 2



Figure 3

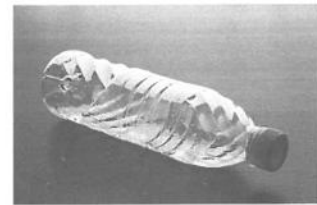


Figure 4

a) **Figure 2**

Plastic:

Reason:

[2 marks]

b) **Figure 3**

Plastic:

Reason:

[2 marks]

c) **Figure 4**

Plastic:

Reason:

[2 marks]

Score: / 16



Textiles

1 Which **one** of the following is a type of natural fibre?

- | | | |
|----------|-----------|--------------------------|
| A | Elastane | <input type="checkbox"/> |
| B | Cotton | <input type="checkbox"/> |
| C | Polyamide | <input type="checkbox"/> |
| D | Polyester | <input type="checkbox"/> |

[1 mark]

2 Which **one** of the following products is **not** commonly made from silk?

- | | | |
|----------|------------|--------------------------|
| A | Sportswear | <input type="checkbox"/> |
| B | Underwear | <input type="checkbox"/> |
| C | Dresses | <input type="checkbox"/> |
| D | Ties | <input type="checkbox"/> |

[1 mark]

3 **Figure 1** shows a pair of jeans, which are made from a denim.

What type of fibre is used to make denim?

- | | | |
|----------|-----------|--------------------------|
| A | Cotton | <input type="checkbox"/> |
| B | Wool | <input type="checkbox"/> |
| C | Elastane | <input type="checkbox"/> |
| D | Polyester | <input type="checkbox"/> |



Figure 1

[1 mark]

4 State **two** ways in which the properties of natural fibres differ to the properties of synthetic fibres.

1.

2.

[2 marks]

5 Which **one** of the following statements is **not** true?

- | | | |
|----------|--|--------------------------|
| A | Yarns are threads that are woven or knitted to make fabrics. | <input type="checkbox"/> |
| B | Yarns can be made from staple fibres or filaments. | <input type="checkbox"/> |
| C | Staple fibres are shorter in length than filaments. | <input type="checkbox"/> |
| D | A 2-ply yarn is made up of two filaments twisted together. | <input type="checkbox"/> |

[1 mark]

6 Tights are often made from nylon.

State the type of fibre that nylon is made from.
Give **one** property of nylon that makes it suitable for tights.

Fibre:

Property:

[2 marks]

7 LYCRA® is a fabric used to make leggings like those in **Figure 2**.

a) Name the fibre used to make LYCRA®.

.....

[1 mark]

b) Give **three** properties that you would expect a fabric made from 100% LYCRA® to have.

1.

2.

3.

[3 marks]

c) Apart from leggings, give **one** other use of LYCRA®.

.....

[1 mark]

8 Fabric for a school cardigan is to be made from 100% wool.

a) State **two** properties of wool that make it suitable for a cardigan.

1.

2.

[2 marks]

b) Give **two** reasons why wool might not be the best fibre to use for a school cardigan.

1.

2.

[2 marks]



Figure 2

Score: / 17

Exam Practice Tip

If you get stuck on a question in the exam don't spend ages on it, move on — you can always go back to it if you've got time at the end. It's not worth wasting time on a question you can't answer and missing out on marks that you could pick up in other questions. Just keep your eye on the clock and don't panic if you're unsure of something.



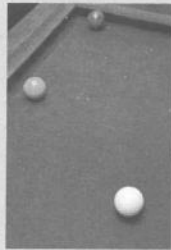
Textiles and Manufactured Boards

Warm-Up

For each textile product shown below, suggest which type of fabric construction (woven, knitted or non-woven) would most likely have been used.



A



B



C

A:

B:

C:

1 Which **one** of the following types of fabric is made by combining pressure, moisture and heat to interlock a mat of wool fibres?

- A Mixed fabrics
- B Felted fabrics
- C Knitted fabrics
- D Woven fabrics

[1 mark]

2 What are bonded fabrics?

.....

[2 marks]

3 A cotton polyester blend is a popular fabric for clothes. State **two** properties of a cotton polyester blend.

1.
 2.

[2 marks]

4 Which **one** of the following statements is **not** true?

- A A plain weave is made by passing the weft yarn over and under alternate warp yarns.
- B Woven fabrics are made using a loom.
- C The warp yarn travels from right to left across the weave, and the weft yarn travels up and down the weave.
- D The edge of a plain weave, where the weft yarn wraps around the warp yarn, is called the selvedge.

[1 mark]

5 Which **one** of the following statements about plywood is **not** true?

- A Plywood is made up of several layers of wood that are glued together.
- B The layers of wood are arranged so that the grain direction is the same in each layer.
- C Plywood is strong for its weight and thickness, compared with solid wood.
- D Plywood is often used in building and furniture.

[1 mark]

6 Fibres can be combined by blending or mixing to give fabrics that incorporate the properties of the different fibres used. Explain the difference between a blended fabric and a mixed fabric.

.....

.....

[2 marks]

7 **Figure 1** is a photo of a manufactured board.

a) Name the type of manufactured board shown in **Figure 1**.

.....

[1 mark]

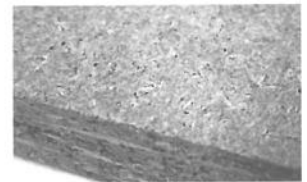


Figure 1

b) State **one** product that it could be used in.

.....

[1 mark]

8 A charity orders T-shirts made from a plain weave fabric, with its logo printed on them. Give **one** reason why a plain weave fabric is a good choice for the T-shirts.

.....

.....

[2 marks]

9 **Figure 2** shows a flat-pack cupboard that has been painted white.

Name a manufactured board that would be suitable for making the flat-pack cupboard shown in **Figure 2**. Give **two** reasons for your answer.

Name:



Figure 2

Reasoning:

.....

.....

[3 marks]

Score: / 16

