Materials: Ceramics, Polymers and Composites: 10-minute Pack

Calculator allowed · about 10 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Choose the material group that includes a clay mug: ceramic, polymer or composite.

(1)

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2 Fibreglass contains glass fibres in a plastic. State the job of the glass fibres and the job of the plastic.

(2)

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3 A builder needs a beam that is strong but not too heavy. A composite beam has mass 3 kg and can safely hold 90 kg. Calculate the supported mass per kilogram of beam.

(2)

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4 A class compares three materials for an outdoor sign. The results are: ceramic tile, hard, waterproof, brittle; polymer sheet, light, waterproof, flexible; plywood composite, stiff, strong, absorbs water at its edges. Which would you choose for a light sign that may be knocked? Explain using two properties.

(3)

5 State one property of ceramics that makes them useful for floor tiles.

(1)

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Question 1

Ceramic. **B1**

Answer: **Ceramic.**

Question 2

Glass fibres make it strong or stiff. **B1**

Plastic holds the fibres together. Accept that it forms or maintains the shape, supports the fibres, or protects them; any one valid role earns this mark. **B1**

Answer: **Fibres add strength; plastic binds them and forms the shape.**

Question 3

Uses 90 / 3. **M1**

30 kg of supported mass per kg of beam. **A1**

Answer: **30 kg per kg.**

Question 4

Chooses polymer sheet. **B1**

It is light. **B1**

It is flexible, so it is less likely to break when knocked (or another supported link). **B1**

Answer: **Choose polymer sheet: it is light and can flex when knocked instead of breaking.**

Question 5

Any one useful property, for example hard, resistant to scratching, durable, or waterproof/easy to clean when glazed. Accept another suitable property for floor tiles. **B1**

Answer: **Ceramics are hard.**

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