NAME: _____ FORM/GROUP _____

DESIGN AND TECHNOLOGY REVISION BOOKLET

4

COMPOSITE MATERIALS - FIRST BOOKLET

NATURAL WOOD
CONCRETE
STEEL REINFORCED CONCRETE
FIBREGLASS / GLASS REINFORCE PLASTIC (GRP)
CARBON FIBRE REINFORCED POLYMER (CFRP)

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SUITABLE REVISION MATERIAL FOR:

PRODUCT DESIGN
RESISTANT MATERIALS
GRAPHIC PRODUCTS
DESIGN AND TECHNOLOGY

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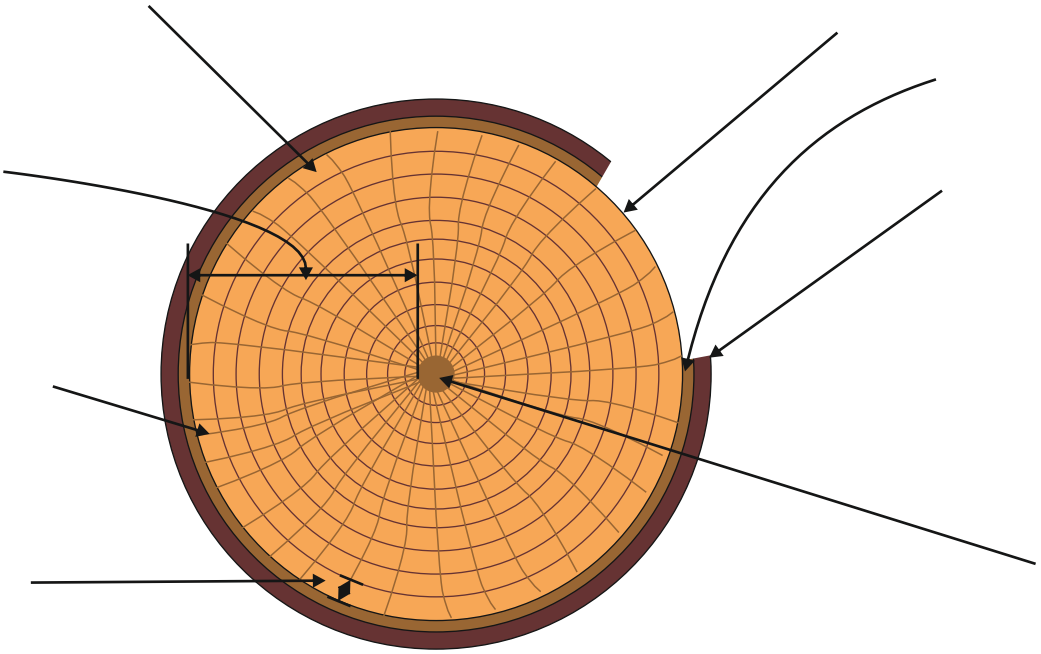
COMPOSITE MATERIALS - NATURAL WOODS

LINK TO HELP AND INFORMATION https://www.technologystudent.com/joints/composit1.html

1a. What is a composite material? ***3 marks***

1b. Why can a natural wood be considered a composite material? **3 marks**

1c. Label the drawing of a cross-section of a tree trunk, naming all the parts, as indicated by the arrows. ***4 marks***



COMPOSITE MATERIALS - NATURAL WOODS - CONTINUED

LINK TO HELP AND INFORMATION https://www.technologystudent.com/joints/composit1.html

1d. Write a description of each of the parts of a tree trunk, listed below. ***5 marks***

PITH: _____

_____

_____

ANNUAL RINGS: _____

_____

_____

HEART WOOD: _____

_____

_____

SAPWOOD: _____

_____

_____

RAYS: _____

_____

_____

COMPOSITE MATERIALS - CONCRETE

LINK TO HELP AND INFORMATION https://www.technologystudent.com/joints/concret1.html

2a. Describe typical practical applications of concrete, around the home and in industry. ***3 marks***

2b. List the individual materials that are mixed to form concrete. ***4 marks***

2c. Name a precast concrete product. This could be a product bought at a typical DIY store. ***1 mark***

2d. In the space below, draw a diagram that clearly shows the structure of concrete. Label the component materials that form this composite material. ***4 marks***

COMPOSITE MATERIALS - CONCRETE

LINK TO HELP AND INFORMATION https://www.technologystudent.com/joints/concret1.html

2e. Using the internet or other research resources, collect images of practical applications of concrete. Glue samples in the space below. Label each image. ***4 marks***

LINK TO HELP AND INFORMATION https://www.technologystudent.com/joints/reinforc1.html

COMPOSITE MATERIALS - STEEL REINFORCED CONCRETE

2f. Describe how the component materials that form **reinforced concrete** are put together. Use a diagram(s) including labels and notes. Add colour and shade to the diagram(s).
5 marks

NOTES:

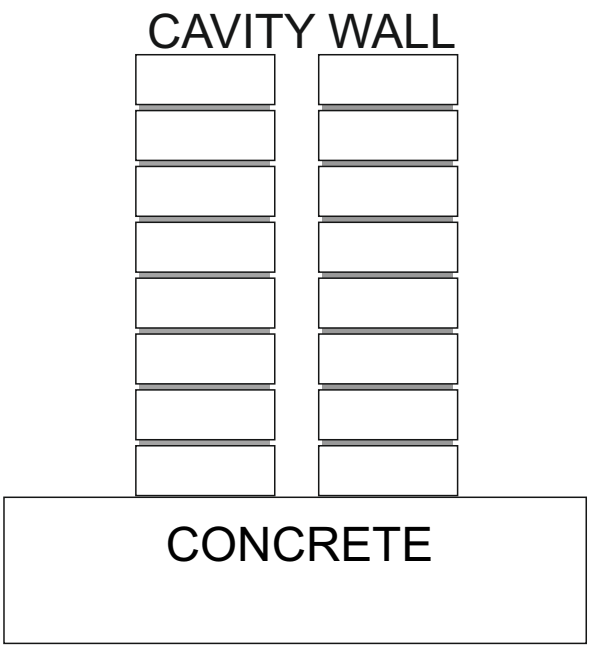
COMPOSITE MATERIALS - STEEL REINFORCED CONCRETE

LINK TO HELP AND INFORMATION https://www.technologystudent.com/joints/reinforc1.html

2g. The incomplete diagram opposite, shows a cavity brick wall, supported by concrete foundations.

Complete the diagram by adding:

A. Arrows that indicate the direction of forces applied to the foundations. ***2 marks***
B. Additional labels. ***2 marks***
C. Notes the explain the forces applied to the cavity wall and foundations. ***3 marks***



2h. Draw a diagram that demonstrates the weakness of concrete, when under a tensile force. Add explanatory notes.

FIBREGLASS / GLASS REINFORCE PLASTIC (GRP)

LINK TO HELP AND INFORMATION https://www.technologystudent.com/joints/fibre1.html

3a. When was Glass Reinforced Fibre invented and by whom? ***2 marks***

DATE:_____

NAME:_____

3b. Describe the structure of a typical piece Glass Reinforced Fibre. Include a sketch of a 'weave' of Glass Fibre textile. (Description - 2 marks Sketch - 2 marks)

DESCRIPTION:_____

SKETCH OF WEAVE

FIBREGLASS / GLASS REINFORCE PLASTIC (GRP)

LINK TO HELP AND INFORMATION https://www.technologystudent.com/joints/fibre1.html

3c. Describe some of the **properties** and **practical applications** of GRP. Use the internet as a research tool to help you answer this question, attaching a selection of images of practical uses to this page.

PROPERTIES: ***3 marks***

PRACTICAL APPLICATIONS: ***5 marks***

CARBON FIBRE REINFORCED POLYMER (CFRP)

LINK TO HELP AND INFORMATION https://www.technologystudent.com/joints/carfib1.html

4a. What is Carbon Fibre Reinforced Polymer? ***3 marks***

4b. Describe two advantages Carbon Fibre Reinforced Polymer has over materials such as GRP and Titanium? ***2 marks***

4c. Describe a disadvantage of CFRP compared to GRP. ***2 marks***

4d. Describe a practical application of CFRP in the aerospace industry. Include an explanation of why CFRP has been used.