

University of South Australia
School of Geoinformatics, Planning and Building

Building Technology 1N
Deferred Examination Semester 1, 1999

Closed book examination

Duration 2 hours

Answer the questions using diagrams where appropriate.

Answer any 4 out of 5 questions

The questions are of equal value

1. What is the principle of bimetallic corrosion? If a copper and steel pipe were joined, explain what would happen if (a) the copper was coated and (b) the steel was coated. What are the underlying reasons for your explanations?
2. Why is it necessary to toughen glass for some applications? Describe the principle of toughening and how this is carried out in practice.
3. A cement mortar beam is tested in flexure measuring the load and deflection as follows:

Load (N)	Deflection (mm)
100	0.2
300	0.5
700	0.8
1100	1.0

Convert these values to flexural strength and flexural strain using the following formulae.

Flexural strength, $\sigma_f = \frac{3 W l}{b d^2}$ Where, W is the load (in N)
l is the span of 150mm

b is the specimen breadth of 40mm
d is the specimen depth of 40mm

Flexural strain, $\epsilon_f = \frac{6de}{l^2}$ Where, e is the deflection (in mm)

Draw an approximate flexural stress vs flexural strain graph in your examination booklet and evaluate the Modulus of Elasticity.

4. Describe the effect of carbon content on the properties of plain carbon steels. What other methods are used to modify the properties of steels?

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5. Briefly answer the following questions
- (a) What is creep in materials?
 - (b) What is meant by fibre saturation point in timber?
 - (c) What is brick growth?
 - (d) Give an alternative name for modulus of rupture.
 - (e) Sketch stress/strain curves for materials which show Hookean and non-Hookean elasticity.
 - (f) Why is it that aluminium does not corrode like steel
 - (g) Float glass is manufactured by floating molten glass over the surface of what?