

Building Technology 1N

Semester 1 Examination 1999

Closed Book examination

Duration: 2 hours

Lecturer: Stephen Pullen

Answer the questions using diagrams where appropriate.

Answer any 4 out of 5 questions

The questions are of equal value

1. Describe the processes that occur when steel corrodes under a droplet of water. What are some other examples of steel corroding and the reasons behind these? Outline cathodic protection using buried steel pipelines and glass lined hot water services as examples.
2. Describe the incidence of solar radiation on ordinary glass. How can glass be modified to change this behaviour? Explain the effect of defects in solar control glass.
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.

$$\text{Flexural strength, } \sigma_f = \frac{3 W l}{b d^2}$$

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

$$\text{Flexural strain, } \epsilon = \frac{6de}{l^2}$$

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. What are the conditions that contribute to the rot or decay of timber and what can you do to minimise these factors? Describe the methods that are used to prevent the degradation of timber.
5. Describe how you could assess the condition of fully hardened and matured reinforced concrete using on site tests. Explain which properties of the reinforced concrete you are testing and what factors affect these properties.