

**UNIVERSITY OF SOUTH AUSTRALIA  
SCHOOL OF GEOINFORMATICS, PLANNING & BUILDING**

PROGRAMS: **Bachelor of Construction Management & Economics &  
Diploma in Built Environment**

COURSE: **CONSTRUCTION SCIENCE 1 (CIVE 1003)**

EXAMINATION: **Semester 1, 2003**

DURATION: **10 mins. of reading time followed by 2\_ hours of exam time.  
Note that ENTEXT students are allowed 10 minutes  
additional time per hour of exam time. In this case 25  
minutes of additional time.**

EXAMINER: **Stephen Pullen Tel. 22753**

INSTRUCTIONS TO CANDIDATES:

- This exam is worth 50% of the total course marks.
  - Attempt all questions.
  - *All questions are of equal value.*
  - No reference materials are allowed. A calculator is allowed.
  - State any assumptions made.
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**Question 1**

Describe the principle of bimetallic corrosion and write notes on the factors that affect the rate of corrosion, giving clear examples where appropriate. If a copper and steel pipe were joined, explain what would happen if (a) the copper were coated and (b) the steel were coated. What are the underlying reasons for your explanation? Use diagrams where suitable.

**Question 2**

How you would calculate the tensile stress in a cylindrically shaped material from a knowledge of the tensile load on that material? Similarly, how would you calculate the strain from the extension? What is the Young's Modulus of a material and how is it calculated? Explain Hookean and non Hookean elasticity. A solid bar of steel 10mm diameter carries a tensile load of 10,000N. What is the tensile stress in the bar? If the Young's Modulus of steel is 200GPa what is the strain?

**Question 3**

What are the essential differences between a one stage and two stage movement joint? State the advantages/disadvantages of both. Name the common types of elastomeric sealants in commercial use. Draw a section through a typical one stage movement joint where the maximum anticipated movement is  $\pm 2\text{mm}$  and the movement accommodation factor of the sealant is  $\pm 12\%$ . Specify typical dimensions.

**Question 4**

Fine aggregate used for good quality concrete differs in its particle size distribution compared with sand used for good quality mortar. What is meant by this statement? What are the effects of this difference on the wet and cured properties of concrete and mortar?

**Question 5**

Write notes on the following aspects of glass and glass products. Use diagrams where appropriate.

- (i) The manufacture of float glass
- (ii) The potential and actual strength of glass and the reasons for the difference.
- (iii) Describe in detail two glass products, which have been developed to overcome this problem.
- (iv) What are GRC and GRP?

END OF QUESTIONS