

**UNIVERSITY COLLEGE LONDON**

University of London

**EXAMINATION FOR INTERNAL STUDENTS**

For The Following Qualification:–

*B.Sc.*

**ES1180: Materials in Construction**

COURSE CODE : **ENVS1180**

UNIT VALUE : **0.50**

DATE : **05-MAY-04**

TIME : **10.00**

TIME ALLOWED : **3 Hours**

## ENVS 1180 MATERIALS IN CONSTRUCTION

### Answer FIVE questions

- (a) Discuss, with reference to choice of materials, precautions and techniques involved in hot-weather concreting. (10 marks)

(b) Discuss the implications of the following attack on hardened concrete by (i) freezing temperatures and (ii) fire up to 900C. (10 marks)
- (a) State and compare the FOUR types of mortar used in brickwork. (10marks)

(b) Sieve analysis on 500g of a sample of sand gave the following data:

Sieve size:	10mm	5mm	2.40mm	1.20mm	600um	300um	150um	pan
Mass of sand Retained (g)	0	5	70	60	75	200	75	15

Calculate %sand passing each of these sieve and sketch a grading curve. (10 marks)
- (a) Discuss the effect of increasing carbon content on the mechanical properties of the metal formed. (12 marks)

(b) Distinguish, giving one example each, between chemical corrosion and electrochemical corrosion of metals. (8 marks)
- With respect to timber technology, discuss the following:

  - Softwood and hardwood
  - Seasoning and conversion
  - Fungal attack and insect attack
  - Visual and mechanical stress grading. (5marks each > 20marks)
- Specify, giving reasons for your choice, ONE plastics material and ONE non-plastics material for use in the following situations:

  - loft insulation
  - underground sewage pipes
  - cold-water storage tank
  - roof guttering and downpipes ( 5 marks each > 20 marks)
- (a) What are the main characteristic properties of each of the FOUR main mineralogical compounds of Portland cement clinker? ( 10 marks)

(b) The compound composition of four types of Portland cement is given below:

Compounds	A	B	C	D
C3S	44%	32%	50%	54%
C2S	35%	45%	28%	16%
C3A	4%	5%	11%	11%
C4AF	12%	12%	3%	10%

Suggest, giving reasons, what types of cement are A, B, C and D. (10 marks)
- Discuss the nature, decay and maintenance of building stones. (20 marks)