

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 : 03–MAY–06

TIME : 14.30

TIME ALLOWED : 3 Hours

ENVS 1180 Materials in Construction

A total of **four** questions must be answered. All questions carry equal marks.

1. (a) Name the **four** main mineralogical constituents present in Portland cement clinker and comment on how each influences the properties of cement (13 marks)
(b) Discuss why aggregate is added to cement and explain how it is possible to grade aggregate (12 marks)
2. (a) Explain the term 'workability' in respect of its use in concrete technology (4 marks)
(b) Discuss one test that is commonly used to measure workability on site and briefly explain how it is carried out (6 marks)
(c) What potential problems can incomplete or inadequate compaction cause to the long-term stability of concrete? (15 marks)
3. (a) Explain why it is important to control the curing of concrete and what measures may be taken during extremes of ambient temperature (10 marks)
(b) Discuss how concrete behaves in fire and comment on what measures may be taken to improve concrete's fire resistance (15 marks)
4. (a) Discuss the conditions under which steel reinforcements corrode in concrete and suggest methods used to minimise corrosion (15 marks)
(b) Discuss the effect of increasing the carbon content of steel on the mechanical properties of the resultant metal (10 marks)
5. (a) Explain how bricks are manufactured (10 marks)
(b) Discuss the use of locally available stones within the UK construction industry, include examples of specific materials explaining why the properties of each makes it suitable for use within construction (15 marks)
6. (a) Briefly explain how float glass is manufactured (10 marks)
(b) Discuss **three** methods of secondary glass manufacture explaining what type of glass is formed and how the properties of the glass are modified (15 marks)

7. (a) Discuss the durability of timber as a construction material (15 marks)
(b) Explain the use of: (i) straw bales; and (ii) cardboard as construction materials (10 marks)
8. (a) Explain the chemical composition and function of each of the following constituents of paint: (i) pigment; (ii) extender; (iii) binder; and (iv) solvent (15 marks)
(b) Discuss the properties and use of **two** of the following types of paint: (i) intumescent paint; (ii) iron oxide paint; (iii) epoxy paints; and (iv) water-repellent paint (10 marks)

END OF PAPER