

# UNIVERSITY COLLEGE LONDON

*University of London*

## EXAMINATION FOR INTERNAL STUDENTS

*For the following qualifications :-*

*B.Sc.*

### **ES1180: Materials in Construction**

COURSE CODE : **ENVS1180**

UNIT VALUE : **0.50**

DATE : **25-APR-02**

TIME : **10.00**

TIME ALLOWED : **3 hours**

02-C0423-3-50

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**TURN OVER**

## ENVS 1180 MATERIALS IN CONSTRUCTION

### Answer FIVE questions

1. (a) Name FOUR main mineralogical compounds present in portland cement clinker AND state their characteristic properties. ( 8 marks)
- (b) Differentiate between the characteristic properties and main applications of the following types of portland cements:
  - (i) rapid-hardening
  - (ii) low-heat
  - (iii) sulphate-resisting
  - (iv) white portland cements(12 marks)
2. (a) Discuss the nature of the following types of deterioration of concrete:
  - (i) carbonation
  - (ii) chloride attack
  - (iii) sulphate attack
  - (iv) alkali-silica reaction.(12 marks)
- (b) Outline how preventive measures may be taken to minimise EACH of the above. ( 8 marks)
3. (a) Explain the mechanism of electrolytic corrosion of iron. (10 marks)
- (b) Discuss the various ways in which such corrosion can be prevented. (10marks)
4. Discuss the use of timber and stone as building materials with reference to:
  - (i) decay and
  - (ii) maintenance.(20 marks)
5. Discuss the relative merits and limitations of using steel, masonry and plastics as construction materials. (20 marks)
6. Discuss the advantages and disadvantages of using:
  - (i) urea formaldehyde foam as cavity fill between walls
  - (ii) perspex as glass replacement in windows
  - (iii) glass-fibre reinforced plastics as structural materials
  - (iv) rigid PVC as a roofing material
  - (v) polythene sheeting as damp proof courses(20marks)
7. (a) With the aid of chemical equations differentiate between the setting and hardening processes of EACH of the following:
  - (i) building limes
  - (ii) gypsum building plasters(12marks)
- (b) Convert a *nominal* mix 1:3:9 (by volume) Of plaster, lime and sand to a *standard* mix (by weight), given that the densities of plaster, lime and sand are respectively 800, 700 and 2600 kg/m<sup>3</sup>. (8marks)

END OF PAPER