

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 : 06-MAY-05

TIME : 10.00

TIME ALLOWED : 3 Hours

ENVS 1180 MATERIALS IN CONSTRUCTION

Answer FIVE questions only

1. (a) Name FOUR main mineralogical compounds of Portland Cement clinker AND discuss, with the aid of examples, their characteristic properties. (15marks)
(b) Convert a *nominal* 1:2:4 (cement:sand:gravel) concrete mix (by volume) to a *standard* mix (by weight), given that the densities of cement, sand and gravel are respectively 3000, 2700 and 2600 kg/m³. (5 marks)
2. In concrete technology, discuss the following operations:
(i) Batching (ii) Transporting (iii) Placing (iv) Compacting (v) Curing. (20 marks)
3. (a) Distinguish, with the aid of chemical equations or otherwise, the *setting* and *hardening* processes of Building Limes and Gypsum Plasters. (10 marks)
(b) Discuss FOUR main advantages of gypsum plasters compared with lime or cement alternative. (10 marks)
4. (a) Discuss the effect of the *metallic* materials in the following situations:
(i) *Copper* pipes connected to a galvanised *steel* water storage tank.
(ii) *Aluminium* window frames in contact with moist concrete.
(iii) *Iron* nails used to secure *tin* sheets.
(iv) *Steel* structures exposed to highly polluted industrial atmosphere.
(v) *Lead* flashings fixed to the parapet walls by rendering with cement:sand mortar. (15 mark)
(b) Outline preventive or remedial measures in EACH of the cases above. (5 marks)
5. Discuss the use of building stones, metals and plastics as building materials. (20marks)
6. With reference to Polymer technology, discuss with the aid of examples:
(i) The process of *polymerisation*.
(i) The distinction between *addition* and *condensation* polymerisations.
(ii) The distinction between *linear*, *branching* and *network* polymers.
(iii) The distinction between *thermoplastics* and *thermoset* materials. (20marks)
7. With respect to timber technology, discuss:
(i) The diagnosis & eradication of fungal and insect attack on timber. (15 marks)
(ii) The Health & Safety implications involved. (5 marks)

END OF PAPER