

LEAVING CERTIFICATE EXAMINATION, 1996

CONSTRUCTION STUDIES - PART I (THEORY)

HIGHER LEVEL

THURSDAY, 20 JUNE - AFTERNOON 2.00 p.m. to 5.00 p.m.

(300 marks are allotted to this paper.)

- (a) Answer Question 1 and four other questions.
 (b) Answer must be written in ink; drawings and sketches to be made in pencil.
 (c) Write the number of the question distinctly in the margin of the paper before each answer.
 (d) Freehand sketches or diagrams to illustrate written descriptions should be made.
 (e) The name, sizes, dimensions and other necessary particulars of each material indicated must be noted on the drawing.
 (f) *All questions carry equal marks.*

1. A timber window frame with outward opening single glazed sash is fixed in a 300mm insulated cavity wall which has external rendering and hard-wall plaster inside. Draw, to a scale of 1:5, a vertical section through the head and sill showing all relevant construction details and surrounding structure.
2. Prepare a cutting list for an external framed, braced and sheeted door 2000 high by 900 wide and describe, with the aid of sketches, how the door should be constructed. Suggest a preservative and also decorative finishes for the door, both inside and outside, and give reasons for your choices.
3. The following are considered to be essential requirements for a satisfactory underground drainage installation:
- (a) watertightness;
 - (b) durability;
 - (c) non-blocking;
 - (d) ease of maintenance.

Discuss each in turn and state how these desirable characteristics can be achieved in below ground drainage design and installation.

4. (a) Calculate the U value of an external cavity wall which is constructed of 100mm thick brick outer leaf rendered 19mm thick, a 100mm thick concrete block inner leaf plastered 13mm thick and a 100mm wide cavity. Use the following data:

External Surface Resistance	(R)	0.053 m ² °C/W
Internal Surface Resistance	(R)	0.123 m ² °C/W
Cavity Resistance	(R)	0.176 m ² °C/W
Conductivity of brick	(k)	0.084 W/m °C
Conductivity of concrete block	(k)	1.44 W/m °C
Conductivity of plaster/render	(k)	0.48 W/m °C

- (b) What thickness of expanded polystyrene should be added in order to satisfy Building Regulations requirements of 0.45 W/m² °C? The resistivity of the expanded polystyrene is 28.6 m °C/W.

5. With the aid of neat sketches explain the procedure and method you would use when setting out a foundation for a garden wall to be built at right angles to the back wall of a dwelling.

OR

Write short notes on the following in terms in structural design:

- (a) strength;
 - (b) stiffness;
 - (c) stability;
 - (d) imposed loads;
 - (e) dead loads.
6. Draw, to a scale of 1 : 10, a longitudinal section to show the constructional details of a non-loadbearing stud partition, 4.20m long by 2.40m high to be constructed up-stairs between a bedroom and a bathroom. Name, and give suitable dimensions for, all component parts and suggest suitable coverings for the partition giving reasons for your choices.
7. Explain:
- (a) how you would seek planning approval from your local planning authority for an extension to a dwelling;
 - (b) the procedure for making an appeal against a decision of your local planning authority.
8. Sketch a central heating installation suitable for a three bedroomed bungalow and describe the functions of the principal components in the system.
9. (a) Sketch a domestic ring main system of electrical wiring.
(b) Discuss the precepts that govern the safety of ring mains in dwellings.
10. (a) Give an outline description of the human hearing system and its response to sound intensities and frequencies.
(b) Explain the meaning of the decibel scale of sound levels.

OR

"Modern buildings of lightweight construction emphasise the problems of sound insulation." Discuss this statement and describe, with the aid of sketches where appropriate, methods of improving sound insulation in such buildings.