LEAVING CERTIFICATE EXAMINATION, 1997

CONSTRUCTION STUDIES - PART I (THEORY)

HIGHER LEVEL

THURSDAY, 26 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.*

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1. An external timber door of a house has a glazed upper panel and the door frame is fixed in a 300 mm cavity wall. Draw, to a scale of 1:5, a vertical section showing constructional details from 200 mm above the head of the door frame to 100 mm below the top of the double glazing. Give suitable sizes for all components.

2. In one and two storey domestic construction timber may be used in many parts of the building. Select TWO elements of house construction, one external and one internal, where timber is used and describe the measures that should be taken in each case to prevent premature deterioration.

3. A concrete block chimney, rendered on all sides, will pass through a tiled roof of 30 degree pitch. Discuss with the aid of sketches how the roof can be made watertight.

4. Alternative methods of providing heat in dwellings are currently available. Describe, with illustrations or diagrams, ONE method of house heating, both space and water heating, supplied by any of the following heat sources:

   (i) oil; (ii) solid smokeless fuel; (iii) gas (L.P.G.).

   In the example chosen explain how the building structure and fuel storage requirements are affected by the choice of method.

5. (a) Calculate the rate of heat loss per sq.m. through an uninsulated cavity wall of an older house constructed of a 100 mm facing brick outer leaf and a 100 mm common brick inner leaf plastered 20 mm thick with a 50 mm wide cavity.

   Use the following data:

Internal surface resistance	0.123m² °C/W
External surface resistance	0.053m² °C/W
Internal temperature	21.0°C
External temperature	1.0°C
Plaster - conductivity (k)	0.50 W/m°C
Facing brick - conductivity (k)	1.47 W/m°C
Common brick - conductivity (k)	1.21 W/m°C
Cavity - resistance (R)	0.176m²°C/W

(b) Explain three of the following terms relating to thermal insulation calculations.

(i) Conductivity.
(ii) Resistivity.
(iii) Resistance.
(iv) Conductance.
(v) Transmittance.

6. (a) Calculate a rise and going for the step of a flight of stairs to span between two floors which are 2660 mm. apart. The steps must comply with the requirements of the Building Regulations for domestic stairs.

(b) Sketch to a suitable scale a vertical section through the bottom three steps of this closed string timber staircase. Include, in your sketch, the newel post and handrail.

7. Describe, with the aid of sketches, the method of construction and weatherproofing you would use for a 30 degree pitched roof spanning seven metres. Give reasons for your choice.

OR

Nature, and humankind, have found three different ways of building:
(a) with an external structure;
(b) with an internal structure;
(c) without any firm structure.
Discuss, with the aid of sketches, and give examples.

8. (a) What is the function of the thermal insulation?

(b) Illustrate the locations where thermal insulation should be provided in a domestic house. Suggest types and thickness of thermal insulation which could successfully be used in each location mentioned and show how the insulation is protected from dampness.

9. Discuss the factors that would influence you in the selection of materials for the interior finishes (including the floor, walls, worktops etc.) of a domestic kitchen.

10. Outline, with the aid of diagrams, the principal stages in the construction of a two-storey house and indicate the particular stages at which inspection is desirable.

OR

You have been invited to be a member of an interview board to appoint a Clerk of Works for the construction of a large two-storey dwelling. What would you look for in the candidate?