



Pre-Leaving Certificate Examination
Triailscrúdú na hArdteistiméireachta

Pre-Leaving Certificate Examination 2006

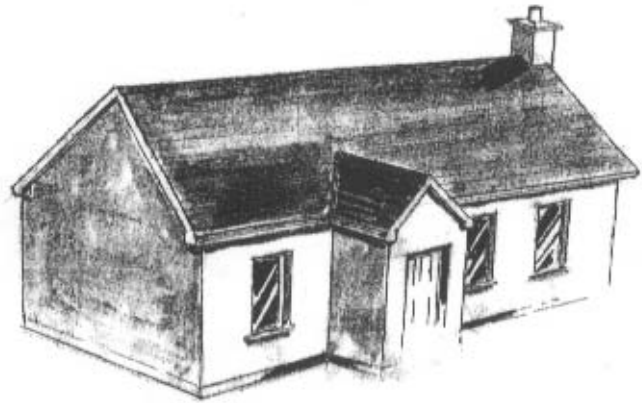
Construction Studies
Theory – Higher Level

(300 marks)

Time: 3 Hours

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

1. A single storey dwelling consists of a 300mm external insulated cavity wall that includes a window opening. The dwelling has a pitched roof of 30°.



- (a) To a scale of 1:10 draw a vertical section through the window from 500mm below the sill to the eaves of the pitched roof.
- (b) Indicate on the drawing where ventilation should be provided in the roof to remove stagnant air.

2. (a) Explain in detail with the aid of *neat freehand sketches* and diagrams the layout of pipe work necessary in the installation of a domestic central heating system.
- (b) Explain why it may be of an advantage to install an indirect hot water system.

3. The sketch shows a flat roofed extension built onto the back of a two-storey dwelling. With the aid of notes and *neat freehand sketches* show the constructional details at:



- (a) the eaves of the roof;
- (b) the abutment to the house.

4. (a) Site selection is a very important part of the planning and building process. List **five** main factors to be considered before choosing a site.
- (b) Discuss in detail the importance of **each** of these factors.
- (c) “Few could argue that the countryside is **one** of our most valuable assets.” Why would this be important to take into consideration when designing houses?

5. (a) Recent research has shown that condensation is more of a problem in modern houses than in houses built more than 30 years ago. Discuss the main factors that cause condensation.
- (b) What changes could be made in order to alleviate this problem?

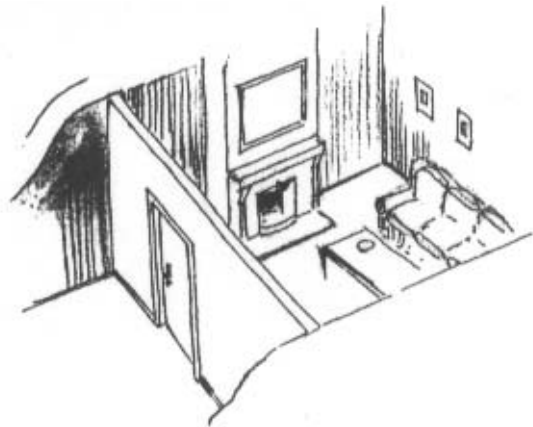
6. (a) Discuss, with the aid of *neat freehand sketches*, the methods by which heat is transferred through a building.
- (b) A flat roof consists of 150mm thick concrete slab finished with 20mm asphalt on a 70mm lightweight concrete screed. The soffit of the slab is plastered 15mm thick. Calculate the u-value of the roof using the following information:

Asphalt	resistivity	=	1.20 m °C/W
Lightweight concrete	resistivity	=	1.96 m° C/W
Concrete Slab	resistivity	=	0.69 m °C/W
Plaster	resistivity	=	2.17 m °C/W
	Internal surface resistance	=	0.104 m ² °C/W
	External surface resistance	=	0.403 m ² °C/W

- (c) What thickness of lightweight concrete would be needed in order to achieve a u-value of 1.05?

7. (a) To a scale of 1:10, draw a vertical section through an open fireplace situated on the ground floor of a house.

- (b) Outline, with the aid of *neat freehand sketches*, the importance of abiding by the building regulations in relation to the efficient flow of smoke through the chimney out of the house.



8. Discuss the principal stages in the construction of a two storey dwelling and indicate the particular stages at which inspection should be carried out.
9. (a) Explain, with the aid of *neat freehand sketches*, the means by which sound is transmitted through a building.
- (b) Modern buildings of lightweight construction emphasise the problems of sound insulation. Discuss this statement and describe, with the aid of *neat freehand sketches* where possible, methods of improving sound insulation in such buildings.
10. A building of architectural merit is threatened with destruction by motorway construction. What arguments might be presented:
- (a) against its preservation;
- (b) in favour of its preservation?

OR

“Part of the art of dealing with wicked problems is the act of not knowing too early which type of solution to apply” (*Ritter and Webel, ‘Dilemmas in a General Theory of Planning’*). Discuss in relation to your Construction Studies Project.