Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2009

Construction Studies

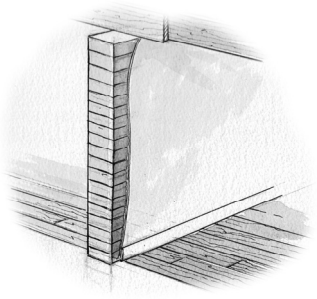
Theory - Ordinary Level

(200 marks)

Wednesday, 17 June
Afternoon, 2:00 to 4:30

(a) *Answer* ***Question 1*** *and* ***three*** *other questions.*
(b) *All questions carry equal marks.*
(c) *Answers must be written in ink.*
(d) *Drawings and sketches to be made in pencil.*
(e) *Write the number of the question distinctly before each answer.*
(f) *Neat freehand sketches to illustrate written descriptions should be made.*
(g) *The name, sizes, dimensions and other necessary particulars of each material indicated must be noted on the drawings.*

1. The sketch shows an internal load bearing wall built of solid concrete blocks. The wall is 225 mm thick and is plastered on both sides. The ground floor is an insulated solid concrete floor. The floor is finished with 25 mm thick hardwood flooring fixed to battens.

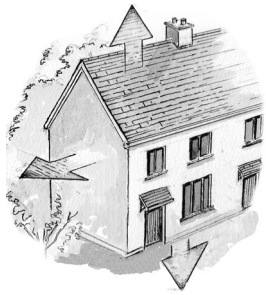


(a) To a scale of 1:5, draw a vertical section through the foundation, the 225 mm wall and the ground floor. Show all the construction details from the bottom of the foundation to 500 mm above finished floor level. Include **four** typical dimensions on your drawing.

(b) Indicate on your drawing the insulation to the floor slab and show clearly the position of the radon barrier.

Note: Show a floor width of 500 mm at either side of the internal wall.

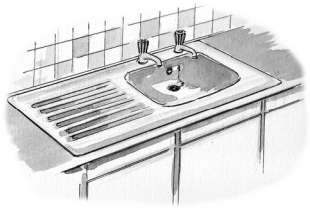
2. The arrows show three areas through which heat is lost in a poorly insulated dwelling house. The house has a slated roof, concrete block external walls with a cavity and a solid concrete ground floor.



(a) Select any **two** areas of the dwelling house and, using notes and ***neat freehand sketches***, describe how you would insulate the areas selected to reduce the heat loss. Indicate on your sketches the type of insulation and give the typical thickness of the insulation.

(b) Discuss **two** advantages of increasing the thermal insulation levels in a dwelling house.

3. **(a)** Using a ***single-line labelled diagram***, sketch a system to supply hot **and** cold water to a kitchen sink, as shown in the accompanying sketch.

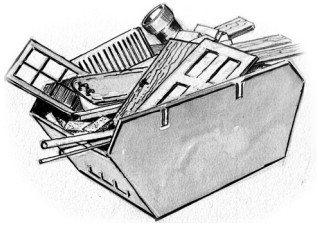


Include the following in your diagram:

- rising main
- water storage tank
- hot water cylinder
- pipework to hot and cold taps
- all necessary valves
- typical sizes of pipework.

(b) Using notes and ***neat freehand sketches***, show one method of ensuring that the water in the cylinder stays hot for as long as possible.

4. The careless disposal of waste in the construction industry can have a harmful impact on the environment. The accompanying sketch shows a mixed range of building materials from a construction site placed in a skip for disposal to a landfill site.

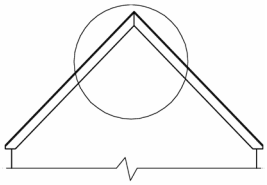


(a) Outline **two** environmental hazards associated with the disposal of this waste to a landfill site.

(b) Using notes and ***neat freehand sketches***, suggest **two** methods of managing the disposal of the waste in a more environmentally friendly manner.

(c) Give **one** example where wood can be reused on a construction site and outline how this helps reduce waste on the site.

5. A dwelling house has a traditional cut roof with a pitch of 45 degrees, as shown in the sketch. The roof, which is insulated, is covered with concrete roof tiles which are supported on 200 mm × 50 mm rafters.



To a scale of 1:5, draw a vertical section through the portion of the roof at the ridge, as shown within the circle in the sketch. Show all the construction details from the top of the ridge to 150 mm below the collar tie and include three courses of tiles at the ridge. Label the roof components and give their typical sizes.

6. **(a)** List **two** safety precautions to be observed in each of the following situations and give **one** reason for **each** safety precaution listed:

- placing ready-mix concrete in a foundation trench
- cutting a pre-stressed concrete lintel.

(b) Workers can be in danger when slating a pitched roof. Using notes and ***neat freehand sketches,*** describe **two** safety precautions that should be observed when slating such a roof.

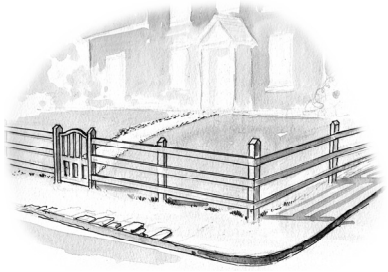
7. **(a)** Describe, using notes and ***neat freehand sketches,*** how rainwater is collected and discharged to ground level from a pitched roof of a dwelling house, as shown in the accompanying sketch. Label the components and give their typical sizes.

(b) In order to conserve water, it is recommended that rainwater be stored for use. Suggest **two** suitable uses for the stored rainwater.

8. Explain, with the aid of notes and ***neat freehand sketches,*** any **five** of the following:

- cross halving joint
- heartwood
- thermal/cold bridge
- double glazing
- soil pipe
- architrave
- radon barrier.

9. Wooden fencing and the entrance gate to the front garden of a house are shown in the accompanying sketch.



(a) Outline **two** environmental reasons why wood is the preferred material for the fencing and gate.

(b) Choose a suitable homegrown wood for the fencing and give **two** reasons for your choice.

(c) Recommend a suitable applied finish to help preserve the wooden fencing from the weather. Using notes and ***neat freehand sketches,*** describe the steps involved in applying the finish to the fencing.

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