Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination, 2015

Construction Studies

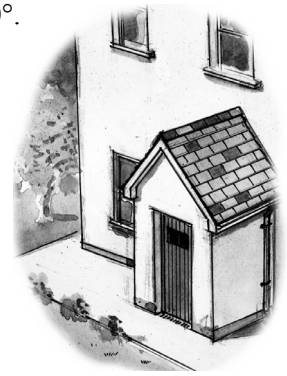
Theory - Ordinary Level

(200 marks)

Friday, 12 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. A front porch with a tiled roof is shown in the sketch. The porch has an internal width of 2.0 metres. The roof of the porch, which is insulated, is a traditional cut roof and has a pitch of 30°. The roof is supported on a 400 mm concrete block wall with a 200 mm full-fill insulated cavity. The rafters and ceiling joists are 200 mm × 40 mm. Insulated plasterboard is also fixed to the underside of the ceiling joists.



(a) To a scale of 1:5, draw a vertical section through one half of the roof of the porch, to show one rafter length. Show the typical construction details from a level 400 mm below the wallplate, through the wall and eaves up to the ridge. Show **three** courses of tiles at eaves. Include **four** typical dimensions.

***Note**: It is not necessary to show the front door.*

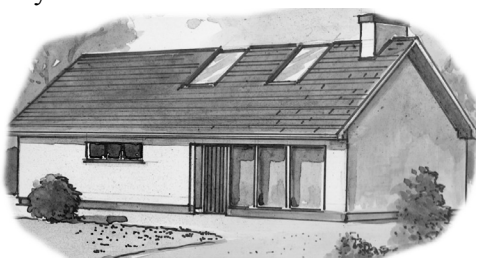
(b) On your drawing, show clearly **one** method of securing the wallplate to the external wall.

2. The sketch shows a dwelling house which was built over 40 years ago. The external wall is a 300 mm concrete block wall with a 100 mm cavity. There is no insulation in the cavity. It is proposed to insulate the external wall by:

- filling the cavity with insulation

and

- adding an external system of insulation to the wall.



(a) Using notes and freehand sketches, show the steps to be followed in applying **each** system of insulation to the wall.

(b) Discuss **two** advantages of insulating the external walls of the house.

3. **(a)** Using a single-line labelled diagram, show the pipework required to provide **hot** and **cold** water to a mixer-shower and to provide **cold** water to a toilet, as shown in the sketch.

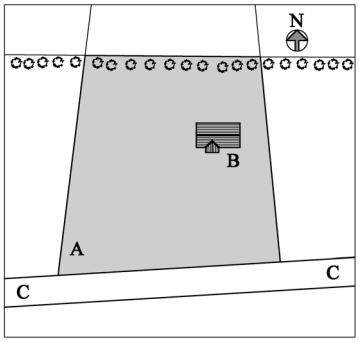
Include the following on your diagram:

- rising main and water storage tank
- hot water cylinder
- typical pipework to mixer-shower and toilet
- all necessary valves.

On your diagram, show the insulation to the water storage tank in the attic and to all the pipework.

(b) Using notes and sketches, show **two** methods of reducing the use of water in a bathroom.

4. The shaded portion of the map shows a site **A** for a house. Also shown is the location of the house **B** and a roadway **C-C**.



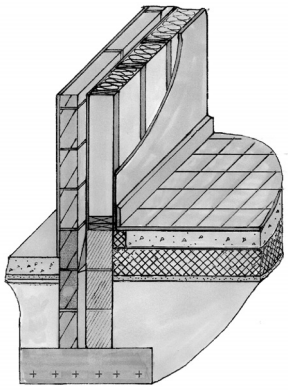
(a) Draw a large freehand sketch of the given site. Show on your sketch a preferred location for **each** of following:

- the entrance to the site at the roadway
- the driveway to the house from the entrance
- the septic tank and percolation area.

(b) For **each** of the above, discuss **one** reason why you selected the preferred location.

(c) It is proposed to plant more trees on the site. Recommend **two** suitable types of tree and show on your sketch where you would plant the trees on the site. Discuss **two** advantages of planting the recommended trees on the site.

5. A traditional strip foundation supports the external wall of a dwelling house, as shown in the sketch. The external wall is of timber-frame construction, with a 100 mm concrete block outer leaf, a 50 mm cavity and a 200 mm insulated timber-frame inner leaf. The ground floor is an insulated concrete floor with a 20 mm quarry tile finish.

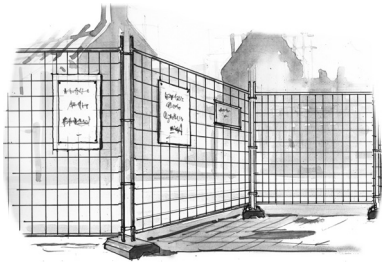


(a) To a scale of 1:5, draw a vertical section through the foundation, external wall and ground floor. Show the typical construction details from the bottom of the foundation, through the wall and ground floor to a level 400 mm above finished floor. Include the radon barrier and show **four** typical dimensions.

(b) On your drawing, show clearly the position of the insulation in the wall **and** in the floor.

6. **(a)** Draw the particular safety signs to show the personal protective equipment (*PPE*) for **each** of the following:

- hand protection
- ear protection
- eye protection.



(b) For **each** of the above, state **one** specific activity where the personal protective equipment you have shown should be worn on a construction site.

(c) Outline **two** activities in the Construction Studies room where it is recommended that personal protective equipment should be worn.

7. A water butt is used to collect rainwater from the pitched roof of a house, as shown.

(a) Using notes and freehand sketches, show the pipework necessary to collect the rainwater from the roof and to store it in the water butt.

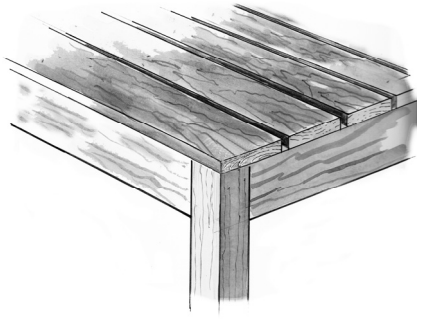
(b) Discuss **two** advantages and **two** disadvantages of using a water butt to store rainwater.

(c) Discuss **two** reasons why it is advisable to harvest rainwater.

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

- box dovetail joint
- cordless drill
- natural seasoning
- triple glazing
- skirting board
- concrete lintel
- solar panel
- compression fitting
- radon barrier.

9. The sketch shows portion of a wooden table. The table is designed for outdoor use.



(a) Using notes and freehand sketches, show a suitable joint for attaching one of the rail to the leg of the table. Give **one** reason for choosing this joint.

(b) Using notes and freehand sketches, discuss **two** design features that make the table suitable for outdoor use.

(c) Recommend a suitable finish for the table. Describe, using notes and freehand sketches, the steps involved in preparing the wood and in applying the recommended finish to the tabletop.

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