Coimisiún na Scrúduithe Stáit
State Examinations Commission

2010. M75

Leaving Certificate Examination, 2010

Construction Studies

Theory - Ordinary Level

(200 marks)

Wednesday, 23 June
Afternoon, 2:00 - 4:30

(a) *Answer* ***Question 1*** *and* ***three*** *other questions.*

(b) *All questions carry equal marks.*

(c) *Answers must be written in ink.*

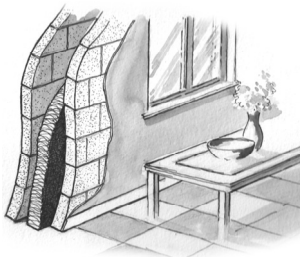
(d) *Drawings and sketches to be made in pencil.*

(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.*

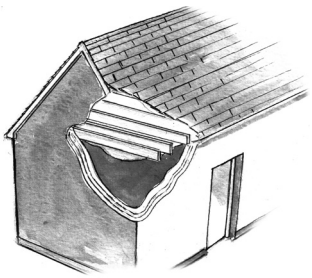
1. A living room has a solid concrete ground floor with a 20 mm quarry tile finish as shown. The external wall of the living room is a 350 mm concrete block wall with an insulated cavity. The wall is plastered on both sides. The foundation is a traditional strip foundation.



(a) To a scale of 1:5, draw a vertical section through the external wall and ground floor. The section should show all the construction details from the bottom of the foundation to 400 mm above finished floor level. Indicate the typical sizes of **four** main components.

(b) Show on your drawing the typical design detailing to prevent a thermal/cold bridge at the junction of the concrete floor and the external wall.

2. The owner of a house built in the 1960s intends to improve the thermal insulation levels by insulating the external walls and the attic space. The external wall is a 300 mm concrete block wall with an uninsulated cavity. The attic space is also uninsulated. It is proposed to inject insulation into the cavity of the external walls.

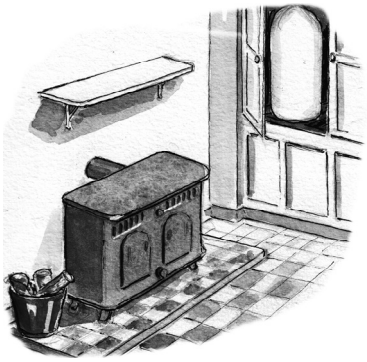


(a) Using notes and ***neat freehand sketches***, describe the procedures to be followed when injecting the insulation into the cavity. Specify the type of insulation to be used.

(b) Discuss **one** advantage and **one** disadvantage of this method of cavity insulation.

(c) Using notes and ***neat freehand sketches,*** show how the attic is to be insulated and include the insulation to the water storage tank. Specify the insulation material for the attic and give its typical thickness.

3. A wood burning stove, as shown in the accompanying sketch, has a back boiler fitted. The back boiler is connected to an indirect cylinder to supply hot water for a dwelling house.



(a) Using a ***single-line labelled diagram,*** show the pipework required to connect the back boiler, cylinder and expansion tank.

Include the following in your diagram:

- back boiler and indirect cylinder
- expansion tank and overflow
- rising main
- pipework and insulation
- valves.

(b) Discuss **two** advantages of using a wood burning stove to heat domestic hot water.

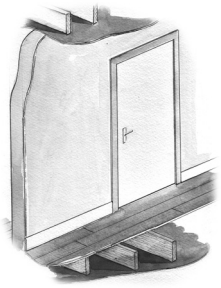
4. A solid pine door and doorframe are shown in the accompanying sketch. The door and frame are fitted in a 100 mm internal concrete block wall which is plastered on both sides.

(a) Show, using notes and ***neat freehand sketches,*** how to ensure that the doorframe is assembled square prior to fitting the door.

(b) Show, using notes and ***neat freehand sketches,*** how the doorframe is fitted in the block wall.

(c) Sketch a suitable hinge for this door and show, using notes and ***neat freehand sketches,*** the steps involved in fitting one hinge to the door.

5. A non-load bearing timber stud partition separates two bedrooms on the first floor of a two storey dwelling house, as shown in the accompanying sketch. The first floor joists are 225 mm × 50 mm, the floor is a tongued and grooved floor and there is a plasterboard ceiling beneath. A flush panel door is fitted in the partition.



(a) To a scale of 1:5, draw a vertical section through the floor and stud partition. Show all the construction details from the bottom of the plasterboard ceiling, through the floor joists, the door and saddle to a point 1.5 metres above finished floor level. Label the components and give their typical sizes.

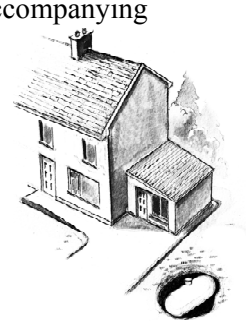
(b) Show on your drawing **one** method that will help reduce the transmittance of sound through the stud partition.

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

- using a ladder when painting an external wall
- using a veneering knife to cut veneers
- using a jig saw to cut a wooden panel.

(b) Using notes and ***neat freehand sketches,*** describe **two** specific safety precautions that should be observed when using electrical tools out-of-doors.

7. An extension to the side of a dwelling house has a lean-to roof, as shown in the accompanying sketch. Also shown is an underground rainwater storage tank.



(a) Using notes and ***neat freehand sketches,*** show how the rainwater is collected from the lean-to roof and discharged to a gulley trap at ground level. Label the components and give their typical sizes.

(b) The rainwater is conveyed to the underground water storage tank for re-use. Using notes and ***neat freehand sketches,*** show the pipework necessary to convey the rainwater from the gulley trap to the storage tank and show the location of a rainwater filter in this system.

(c) Discuss **two** advantages of storing rainwater and give **two** suitable uses for the stored rainwater.

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

- concrete lintel
- door saddle
- triple glazing
- mortice and tenon
- quarter sawing
- window cill
- energy rating
- ridge board
- vapour barrier.

9. A terrace of traditional houses is shown in the accompanying sketch. The houses have slated roofs and wooden windows and doors. The windows are in need of repair.

(a) Discuss **two** reasons why it is advisable to repair the existing wooden windows in these houses rather than replace them with new windows.

(b) Describe, ***using notes and neat freehand sketches,*** the steps to be followed when replacing a broken pane of glass in one of the windows.

(c) Describe, ***using notes and neat freehand sketches,*** the steps to be followed when removing the existing paint, preparing the surface and repainting a window frame in one of the houses.

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