



Leaving Certificate Examination, 2014

Construction Studies

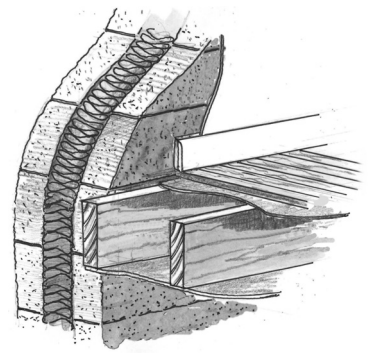
Theory - Ordinary Level

(200 marks)

Friday, 13 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 a portion of the external wall and the first floor of a two storey dwelling house. The external wall is a 350 mm concrete block wall. The cavity is filled with blown polystyrene beads. The first floor is a floating tongued and grooved hardwood floor, on 20 mm plywood, on 225 mm × 40 mm joists with a plasterboard ceiling beneath.



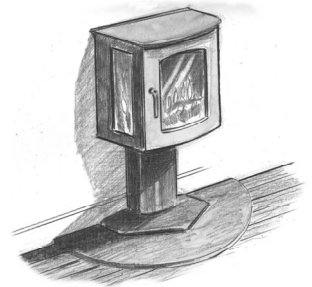
- (a) To a scale of 1:5, draw a vertical section through the external wall and the first floor. The section should show the typical construction details from a level 300 mm below the plasterboard ceiling, through the wall, joists and floor, to a level 400 mm above the finished floor. Include **four** typical dimensions on your drawing. *Show 1.0 metre width of floor.*
- (b) On your drawing show **one** method to prevent the floor joists from twisting.

2. The sketch shows a single storey extension to a dwelling house. The external wall of the extension is a single leaf, 215 mm solid concrete block wall. The wall has an external render but it is not insulated. It is proposed to improve the insulation properties of the external wall of the extension by fixing insulation, 200 mm in thickness, to the outside of the wall.



- (a) Using notes and freehand sketches show **one** method of fixing the insulation to the solid block wall of the extension. Specify the insulation material to be used.
- (b) Using notes and freehand sketches show the steps involved in applying a reinforced mesh **and** an external surface finish to the insulation.
- (c) List **two** advantages of improving the insulation properties of the external wall of the extension.

3. (a) A modern wood burning stove, as shown in the sketch, is fitted with a back boiler. The back boiler is connected to an indirect cylinder to provide hot water for a dwelling house. Using a single-line labelled diagram, show the pipework necessary to supply **hot** water to the kitchen sink.



Include the following on your diagram:

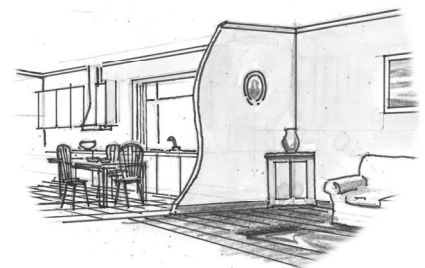
- water storage tank and overflow pipe
- rising main
- stove and back boiler
- hot water cylinder and pipework
- location of all necessary valves.

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

- (b) Discuss **two** advantages of adding a solar panel to supply hot water to a dwelling house.

4. A non load-bearing timber stud partition, with plasterboard on both sides, separates a kitchen and living room, as shown in the sketch.

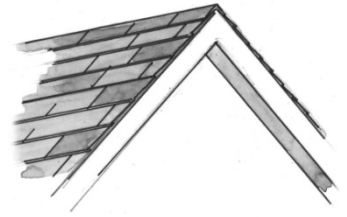
- (a) Using notes and freehand sketches show the typical construction details of the timber stud partition. Name the main components and give their typical dimensions.



- (b) Show **one** method of fixing a double electrical socket in the stud partition.
- (c) Using notes and freehand sketches, show the steps involved in applying a plaster skim finish to one side of the stud partition.

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

(a) To a scale of 1:5, draw a vertical section through the portion of the roof at the ridge. Show the typical construction details from the top of the ridge to a level 150 mm below the collar ties. Include the ridge tile and three courses of tiles at the ridge. Label the roof components and include **three** typical dimensions.



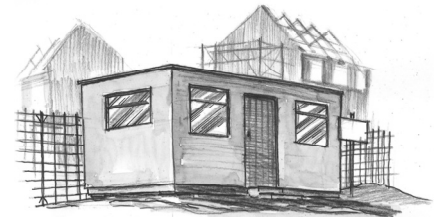
(b) On your drawing, show **one** method of ventilating the roof structure.

6. (a) For **each** of the following, draw the particular safety sign to indicate that the following personal protective equipment (*ppe*) must be worn on a construction site:

- safety helmet
- high visibility vest
- safety boots.

(b) State **one** reason why **each item** of personal protective equipment listed at 6(a) above must be worn on a building site.

(c) Discuss **two** reasons why visitors must report to the site office on entering a construction site.

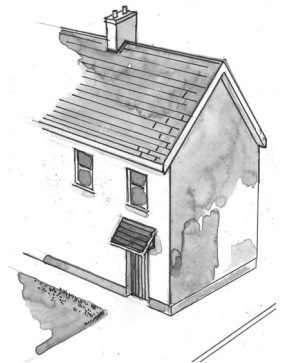


7. A two-storey house with a slated roof is shown in the sketch. It has been decided to collect and store the rainwater from the roof for reuse.

(a) Using notes and freehand sketches, show how the rainwater could be collected from the roof and stored for reuse.

(b) List **two** advantages of storing rainwater and suggest **two** suitable uses for the stored rainwater.

(c) Discuss **one** advantage and **one** disadvantage of fitting a water meter to the mains water supply of a dwelling house.



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

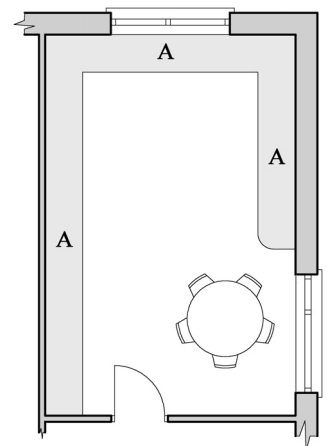
- strip foundation
- housing joint
- laser beam
- thermostatic valve
- collar tie
- radon sump
- roof-light window
- smart meter
- external ramp.

9. The plan of a small kitchen in a new dwelling house is shown. The position of the worktop is shown at **A**. The location of the windows is also shown.

(a) Draw a freehand sketch of the given plan and on your sketch show your preferred location for each of the following: **sink, cooker and fridge**. Give reasons for selecting each location.

(b) The kitchen cabinets are hand painted wooden cabinets. Describe, using notes and freehand sketches, the steps involved in preparing the wood and in applying a high quality hand painted finish to one of the cabinet doors.

(c) A choice is to be made between a polished granite worktop and a solid wood worktop. Discuss **one** advantage and **one** disadvantage of each worktop. Recommend a preferred worktop and give **two** reasons for your recommendation.



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