



Leaving Certificate Examination, 2013

Construction Studies

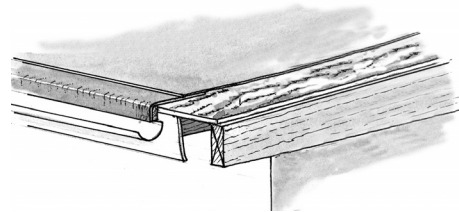
Theory - Ordinary Level

(200 marks)

Friday, 14 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 eaves of a timber flat roof for a bathroom is constructed as shown in the sketch. The roof is covered with layers of bituminous felt on plywood decking on 200 mm × 50 mm roof joists. The roof is insulated and there is a plasterboard ceiling beneath. The external wall supporting the flat roof is a 350 mm concrete block wall with an insulated cavity.

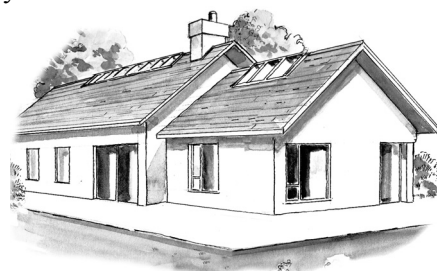


- (a) To a scale of 1:5, draw a vertical section through the eaves of the flat roof and through the external wall. The section should show the typical construction details from 400 mm below the wallplate, through the wall, fascia, soffit and roof joists and include the roof surface. Show 1.5 metres length of roof joist and include **four** typical dimensions.
- (b) On your drawing, show how rainwater is removed from the flat roof.

2. The sketch shows a dwelling house which was built over ten years ago. The external walls of the house are 300 mm concrete block walls with an un-insulated cavity.

It is proposed to improve the insulation properties of the external walls by:

- insulating the cavity *and*
- adding a system of insulation to the inside of the walls.



- (a) Using notes and neat freehand sketches, show how to apply **each** system of insulation to the wall. For **each** system of insulation, specify the insulation material used and include details of the internal surface finish of the wall.

- (b) List **two** advantages of improving the insulation properties of the external walls of the house.

3. (a) Using a single-line labelled diagram, show the pipework necessary to supply hot **and** cold water to a wash hand basin and a bath, as shown in the sketch.

Include the following in your diagram:

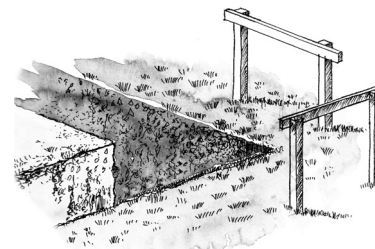
- water storage tank and overflow
- rising main
- hot water cylinder and pipework
- insulation to the water storage tank and to all pipework
- location of all necessary valves.



- (b) Show, using notes and neat freehand sketches, a design for a tap which will be easy to use by a person with limited hand mobility.

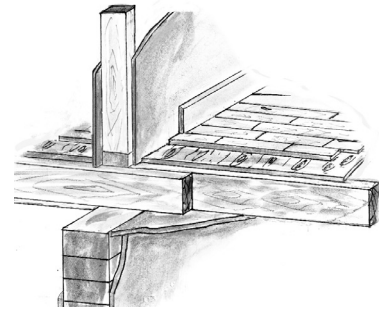
4. (a) One corner of a trench for a strip foundation is shown in the sketch. Describe, using notes and neat freehand sketches, the setting-out of a typical strip foundation under the following headings:

- levelling the profiles
- locating the position of the trench
- squaring the corner of the trench
- locating the finished level of the concrete in the foundation.



- (b) Draw a sketch of a typical strip foundation for a 350 mm concrete block external wall and show the position of the reinforcing in the foundation. Include **three** typical dimensions in your sketch.

5. A non load-bearing stud partition separates two upstairs bedrooms in a dwelling house. The floor and partition are supported on a 215 mm solid block wall, as shown in the sketch. The floor is a floating tongued and grooved oak floor on plywood, on 200 mm × 50 mm joists with a plasterboard ceiling beneath.



To a scale of 1:5, draw a vertical section through the stud partition and the floor. Show the typical construction details from a level 300 mm below the plasterboard ceiling, through the wall, floor and partition to a point 400 mm above the finished floor level. Include **three** typical dimensions on your drawing.

Note: Show a floor width of 500 mm at each side of the partition.

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:

- eye protection
- ear protection
- safety gloves.

- (b) For **each** item of personal protective equipment listed at 6(a) above, outline **one** specific task on a building site where workers must wear the personal protective equipment.

- (c) List **one** other item of personal protective equipment that must be worn at all times on a construction site and discuss the reasons why the wearing of this item is compulsory.

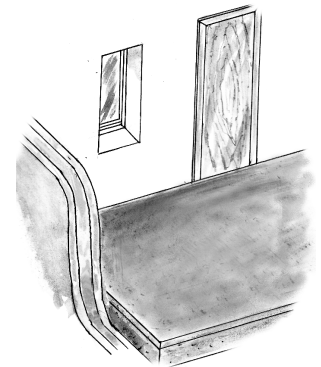


7. A dwelling house has an insulated solid concrete ground floor which abuts a 350 mm concrete block external wall with an insulated cavity, as shown in the sketch. The floor has a sand/cement fine screed finish.

- (a) Show, using notes and neat freehand sketches, the typical design detailing at the junction of the floor and wall. Label the floor components and include **three** typical dimensions.

- (b) Show clearly on your sketch the typical design detailing which will prevent the formation of a cold bridge at the junction of the floor and the wall.

- (c) Recommend a suitable floor covering for a bathroom on the ground floor of the house and give **two** reasons for your choice of floor covering.



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

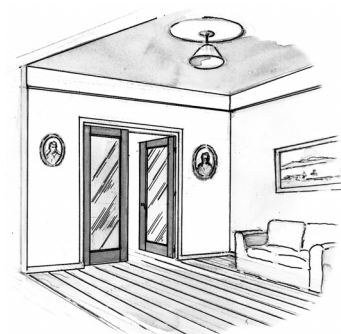
- solar panel
- dovetail halving joint
- sash cramp
- flue liner
- purlin
- water-table
- wind turbine
- low-e coating
- vapour barrier.

9. Two solid oak doors with glazed panels are fitted in the dividing wall between a sitting room and a kitchen, as shown in the sketch.

- (a) Show, using notes and neat freehand sketches, a suitable joint for joining the top rail to the vertical stile of the door.

- (b) Show, using notes and neat freehand sketches, how to fit **one** glass panel safely in the door.

- (c) Discuss **two** advantages of fitting glazed double doors between the sitting room and the kitchen in a dwelling house.



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