



Leaving Certificate Examination, 2012

Construction Studies

Theory - Ordinary Level

(200 marks)

Friday, 15 June
Afternoon, 2:00 to 4:30

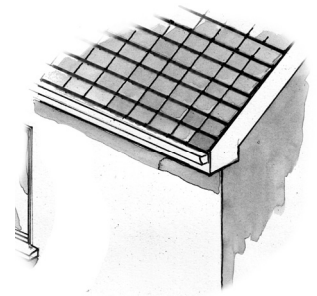
- (a) Answer **Question 1** and **three** other questions.*
- (b) All questions carry equal marks.*
- (c) Answers must be written in ink.*
- (d) Drawings and sketches to be made in pencil.*
- (e) Write the number of the question distinctly before each answer.*
- (f) Neat freehand sketches to illustrate 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 tiled roof of a dwelling house, which is supported on a 350 mm external concrete block wall with an insulated cavity. The roof is a traditional cut roof and has a pitch of 45°.

(a) To a scale of 1:5, draw a vertical section through the eaves of the tiled roof and the external wall. Show the typical construction details from a level 400 mm below the wall plate, through the eaves and include **three** courses of tiles at eaves.

Include the roof insulation and show clearly the ventilation path to the roof structure at the eaves. Include **three** typical dimensions.

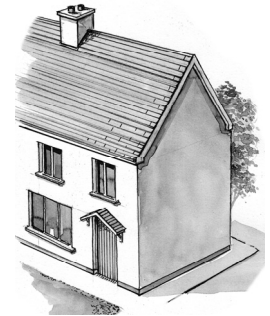
(b) On your drawing, show **one** method of closing the cavity at eaves level.



2. A dwelling house, as shown in the sketch, has a 300 mm external block wall with 50 mm expanded polystyrene insulation in the cavity. The wall has a smooth external render finish. It is proposed to improve the insulation properties of the wall by adding an external system of insulation.

(a) Using notes and neat freehand sketches, show **one** suitable method of applying an external insulation system to the wall. Specify the insulation material used, indicate its typical thickness and include details of the external surface finish to the insulation.

(b) List **two** advantages of applying an external system of insulation to the walls of an existing house.



3. A dwelling house is connected to the public water supply system to provide clean, treated water for the household.

(a) Using a single-line labelled diagram, show the pipework required to supply cold water to a kitchen sink, as shown in the sketch.

Include the following in your diagram:

- pipework from public mains to kitchen sink
- location of valves
- material and typical size of pipework.

(b) Include in your sketch **two** design details that would prevent the water in the mains supply from freezing during very cold weather.

(c) Outline **two** ways in which the household could reduce the use of treated water from the public water supply.

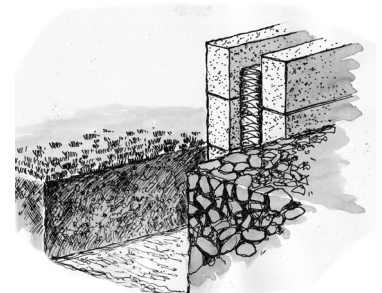


4. A strip foundation is designed to support a 350 mm external wall of a dwelling house. The wall is of concrete block construction with an insulated cavity, as shown in the sketch.

(a) Describe, using notes and neat freehand sketches, the design of a typical strip foundation for the above external wall under the following headings:

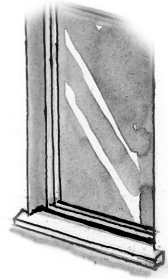
- width and depth of trench
- finished level of concrete in foundation
- reinforcement of foundation
- position of wall on strip foundation.

(b) Discuss **two** environmental reasons why a strip foundation is the preferred foundation type for the external wall of the house.



5. A triple-glazed timber casement window, as shown in the sketch, is fixed in a 350 mm external concrete block wall with an insulated cavity. The fixed frame of the window is 150 mm × 80 mm. The wall is plastered on both sides.

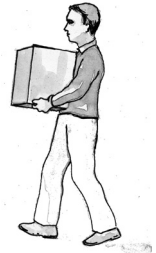
- (a) To a scale of 1:5, draw a vertical section through the bottom portion of the window showing the fixed frame of the window and the concrete cill. Show the typical construction details from 300 mm below to a level 250 mm above the concrete cill. Indicate the typical sizes of **three** main components.
- (b) Include in your drawing the typical design detailing that would prevent the formation of a thermal/cold bridge at the concrete cill.



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

- manually lifting a load from a floor
- placing concrete in a foundation trench from a ready-mix truck.

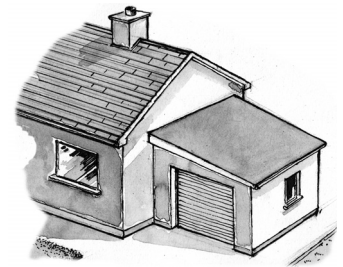
(b) Using notes and neat freehand sketches, describe **two** items of personal protective equipment that must be worn on a building site and discuss the importance of **each** item to ensure the personal safety of workers on a building site.



7. A homeowner wishes to obtain planning permission to convert an existing garage to a living room, as shown in the accompanying sketch.

- (a) Discuss **two** reasons why it is necessary to apply for planning permission to convert the garage to a living room.
- (b) Outline the information that must be contained in **each** of the following documents when making a planning application to the planning authority:

- site location map
- copy of site notice.



(c) Discuss **one** reason why a planning authority might refuse planning permission for the proposed conversion.

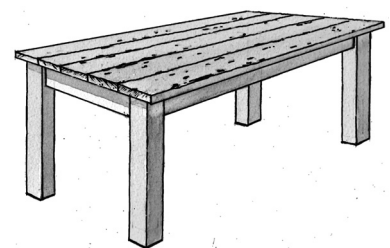
8. Explain, with the aid of notes and neat freehand sketches, any **five** of the following:

- | | | |
|------------------|------------------------------|---------------------|
| • rainwater butt | • box dovetail joint | • compression joint |
| • wall tie | • gully trap | • angle bead |
| • newel post | • through and through sawing | • biscuit joint. |

9. The sketch shows a traditional dining table made from solid oak.

(a) Show, using notes and neat freehand sketches, a suitable method of jointing the front rail to the leg and discuss why the method of jointing shown is suitable.

(b) It has been decided to restore the tabletop, which has become damaged over time, as shown. Show, using notes and neat freehand sketches, the steps involved in removing the marks and in preparing the tabletop for the application of a new applied finish.



(c) Recommend a suitable applied finish for the tabletop. Describe, using notes and neat freehand sketches, the steps to be followed when applying the recommended finish.

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