



Leaving Certificate Examination, 2017

Construction Studies

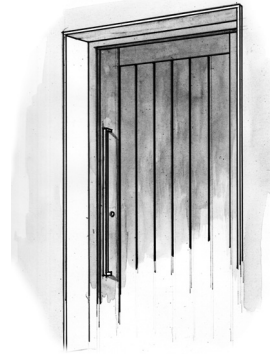
Theory - Ordinary Level

(200 marks)

Friday, 16 June
Afternoon, 2:00 to 4:30

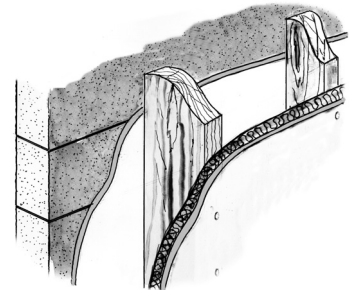
- (a)*** Answer **Question 1** and **three** other questions.
- (b)*** All questions carry equal marks.
- (c)*** Answers must be written in ink.
- (d)*** Drawings and sketches to be made in pencil.
- (e)*** Write the number of the question distinctly before each answer.
- (f)*** Neat freehand sketches 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 main door of a house is an insulated wooden door with 12 mm cedar sheeting on both sides, as shown. The door is fitted in a 400 mm concrete block external wall with a full-fill insulated cavity. The wall is rendered on both sides. The doorframe is 150 mm × 70 mm and the door is 90 mm in thickness.



- (a) To a scale of 1:5 draw a vertical section through the top of the door, showing the wall, the concrete lintels over the door, the doorframe and the door. Show the typical construction details from 400 mm below the lintels to a level 400 mm above the lintels. Include **three** typical dimensions on your drawing.
- (b) Show clearly on your drawing how to prevent the penetration of rainwater at the head of the door.

2. The external wall of a new house has a 100 mm concrete block outer leaf, a cavity and a 200 mm inner leaf of timber frame construction, as shown. The inner leaf is insulated and insulated plasterboard is also fixed to the timber studs.



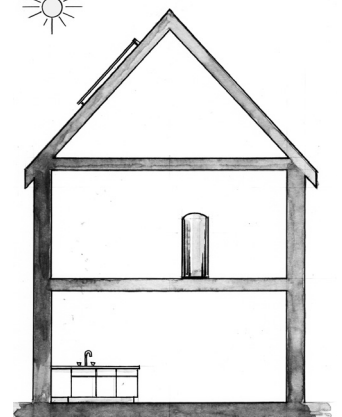
- (a) Using notes and freehand sketches show how the inner leaf is to be insulated. Specify the type and thickness of insulation.
- (b) List **two** advantages of insulating the **inner** leaf of the wall.
- (c) On a separate sketch, show **one** method of providing a surface finish to the plasterboard prior to painting.

3. (a) A solar panel is used to provide hot water for a dwelling house as shown. Draw a large freehand sketch of the given house and, on your sketch, show the pipework necessary to supply **hot water** to a kitchen sink.



Include the following in your diagram:

- solar panel
- rising main and cold water storage tank
- hot water cylinder, as shown
- pipework from solar panel to cylinder
- expansion tank / vessel
- pipework to hot tap
- all necessary valves.



- (b) Discuss **two** advantages of using a solar panel to provide hot water for a dwelling house.
- (c) On a **separate sketch**, show a design for a tap which will be easy to use by a person with limited hand movement.

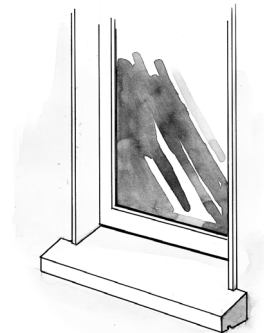
4. (a) The sketch shows waste materials from a house under repair. To improve waste management, this waste needs to be sorted and stored on-site for reuse. Using notes and freehand sketches, show how to properly sort and store this waste.

- (b) Discuss **two** reasons why waste should be kept to a minimum on a construction site.
- (c) Recommend **two** suitable uses for the wood that has been sorted on-site for reuse, and give **one** specific reason in support of **each** recommendation.



5. A triple-glazed wooden casement window, as shown, is fixed in a 400 mm external concrete block wall with a full-fill insulated cavity. The fixed frame of the window is 100 mm × 80 mm and is thermally broken. The wall is rendered on both sides.

- (a) To a scale of 1:5, draw a vertical section through the external wall and 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. Include **three** typical dimensions on your drawing.

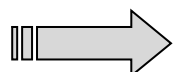


- (b) Show on your drawing the typical design detailing to prevent the formation of a cold bridge at the concrete cill.

6. (a) Discuss **two** reasons why safety signs must be displayed at the entrance to a construction site, as shown.

- (b) Using notes and freehand sketches, show **three** items of personal protective equipment (PPE) that must be worn by workers on a construction site. Give **one specific** reason why each item of personal protective equipment must be worn.

- (c) Describe **two** specific safety precautions that should be observed when using electric power tools on a construction site.



7. The sketch shows an attic which is being converted to provide an additional bedroom. The floor is a tongue-and-groove hardwood floor.

- (a) Show, using notes and freehand sketches, **one** method of preventing the floor joists from twisting.
- (b) Using a large freehand sketch, show the tongue-and-groove joint between two flooring boards and list **two** advantages of this method of jointing.
- (c) Discuss **one** advantage and **one** disadvantage of converting an attic to provide additional bedroom accommodation.



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

- handrail
- damp-proof course
- wind turbine
- box dovetail joint
- ball valve
- joist hanger
- purlin
- energy rating
- service cavity.

9. The sketch shows sliding doors which open on to an external patio at the rear of a house. The patio is constructed using softwood decking on wooden joists.

- (a) Show, using notes and freehand sketches, how to fix the wooden decking to the joists to ensure that the decking does not warp or bow, especially during wet weather.
- (b) Recommend a suitable applied finish to preserve the external decking. Using notes and freehand sketches, describe the steps involved in preparing the wood and in applying the recommended applied finish.
- (c) An external patio has many advantages for the occupants of a dwelling house. Discuss **two** advantages of having an external patio, as shown.

