



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination, 2022

Construction Studies

Theory - Ordinary Level

(150 marks)

Friday, 17 June
Afternoon, 2:00 - 4:30

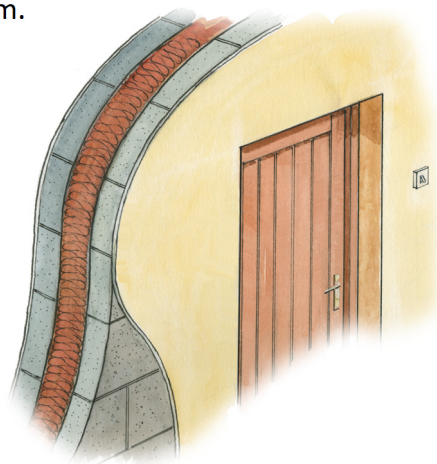
- (a)*** Answer ***any three*** questions.
- (b)*** All questions carry equal marks.
- (c)*** Answers must be written in ink.
- (d)*** Drawings and sketches are to be made in pencil.
- (e)*** Write the number of the question distinctly before each answer.
- (f)*** Neat freehand sketches to illustrate written descriptions should be made.
- (g)*** The name, sizes, dimensions and other necessary particulars of each material indicated must be noted on the drawings.

Do not hand this up.

**This document will not be returned to the
State Examinations Commission.**

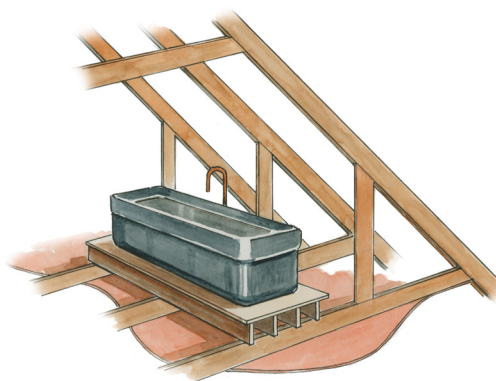
1. The sketch shows the front door of a dwelling house. The external wall is a 400 mm concrete block wall with a full-fill insulated cavity. The wall is plastered on both sides. The doorframe, which is fixed in the wall is 150 mm × 80 mm. The highly insulated wooden door is 90 mm in thickness with 15 mm vertical sheeting on both sides.

- (a) To a scale of 1:5, draw a vertical section through the external wall, concrete lintels, doorframe and door. On your drawing show the typical construction details from 400 mm below to a level 400 mm above the concrete lintels. Include **four** typical dimensions.
- (b) On your drawing, show the typical design detailing to ensure that the cavity is closed at the door head.



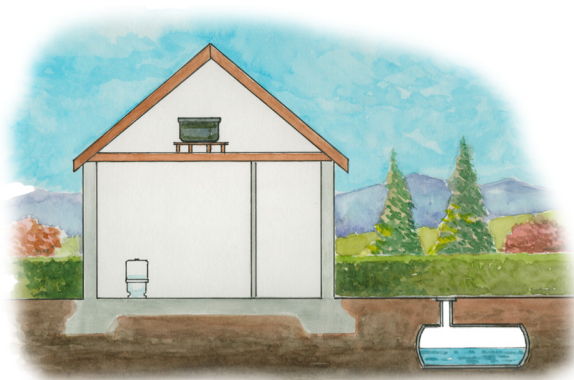
2. The sketch shows the uninsulated attic space of a dwelling house. The homeowners wish to add insulation to the roof at ceiling joist level and around water storage tank. The ceiling joists are 200 mm × 40 mm.

- (a) Using notes and freehand sketches, show **one** suitable method of insulating the roof at ceiling joist level. Specify the type and thickness of insulation.
- (b) The water storage tank and pipework in the attic are also to be insulated. On a separate sketch show, using notes and freehand sketches, how the water tank and pipework could be insulated.
- (c) Discuss **two** advantages of highly insulating the attic space of a house.



3. Rainwater can be collected from the roof, stored and reused in a dwelling house.

- (a) Draw a large freehand sketch of the given house and underground storage tank. On your sketch show the pipework necessary to collect the rainwater from the roof and carry it to the underground tank.
- (b) The stored rainwater is used for flushing toilets. On the sketch, show the pipework necessary to take rainwater from the underground tank to the storage tank in the attic. Show the pipework necessary to connect the toilet cistern to the storage tank in the attic. Include all necessary pumps and valves.
- (c) Discuss **one** advantage of reusing rainwater in a dwelling house.

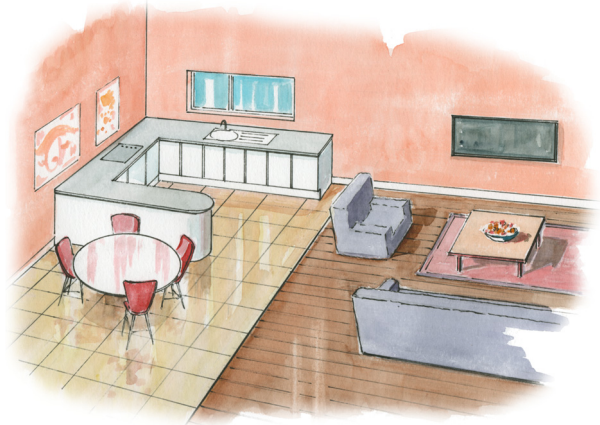


4. The sketch shows an open-plan kitchen and living room. The homeowner has decided to construct a timber stud partition with a door to separate these areas.

- (a) Using notes and a freehand sketch, show the typical construction details of the stud partition required to separate the rooms.

Include the following in your sketch:

- headplate
- soleplate
- timber studs
- noggins
- door lintel.



- (b) Discuss **one** advantage and **one** disadvantage of using a timber stud partition to create separate rooms.

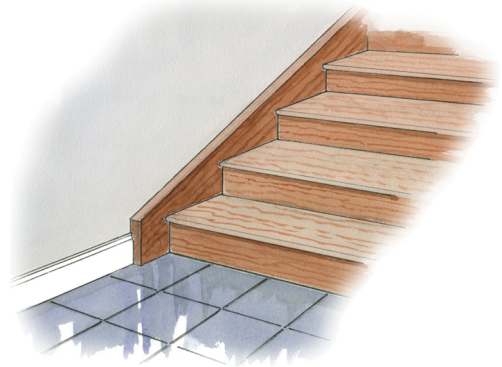
- (c) Discuss **two** reasons for creating a living room which is separate from the kitchen.

5. The sketch shows a portion of a closed-string wooden stairs in a dwelling house. The rise of each step is 170 mm.

- (a) To a scale of 1:5, draw a vertical section through the centre of the bottom **three** steps of the stairs. Show the string, treads and risers.

Include **three** typical dimensions on your drawing.

- (b) On your drawing, show **one** design detail to prevent creaking when the stairs is in use.



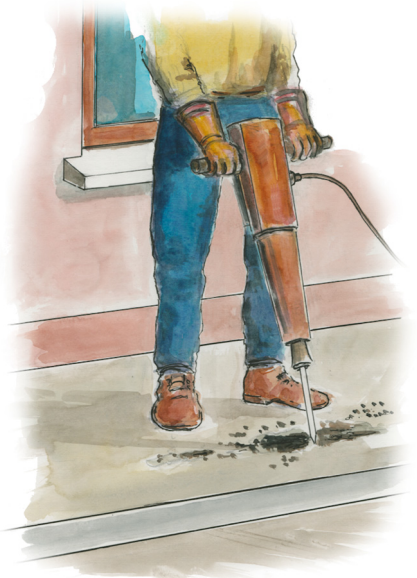
6. The sketch shows a construction worker using a jackhammer on a public footpath.

- (a) Using a large freehand sketch, show **three** safety signs highlighting the use of personal protective equipment (PPE) that must be worn by workers while using a jackhammer.

For **each** sign, state how the personal protective equipment protects workers while using the jackhammer.

- (b) Describe **two** potential risks to a construction worker when using power tools on a construction site.

- (c) Using notes and a freehand sketch, describe **one** safety precaution that will reduce the risk to the public while the footpath is being replaced.

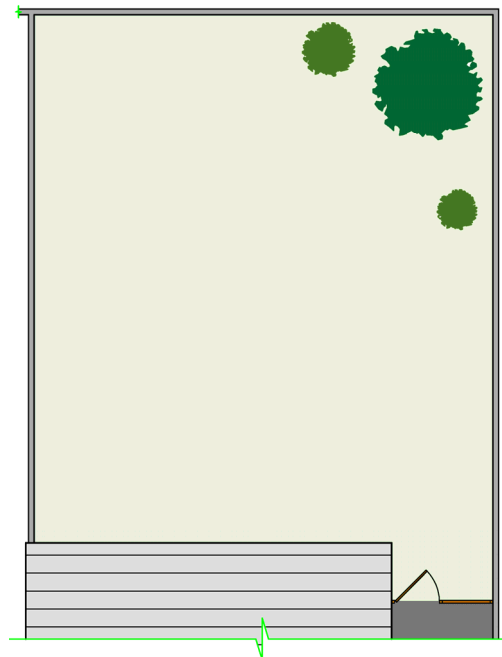


7. The draft design for a rear garden of a semi-detached house is shown. The homeowners wish to create a garden space to meet their family needs. The position of existing trees is shown.

- (a) Discuss **two** reasons why it is important to create a garden space that meet the needs of the family.
- (b) Draw a large freehand sketch of the given design and show your preferred location for **each** of the following in the garden area:
- *outdoor dining/living space*
 - *garden storage*
 - *flower beds*
 - *lawn area.*

Give **one** reason for selecting **each** location.

- (c) Discuss **two** advantages of incorporating trees and plants into a garden design.



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

- | | | |
|--------------------|-------------------|-----------------------|
| • strip foundation | • fascia board | • airtight tape |
| • wind turbine | • septic tank | • dovetail joint |
| • wall tie | • cordless jigsaw | • underfloor heating. |

9. The sketch shows a detached rural house with a front porch. The porch is of timber frame construction with an external wooden cladding.

- (a) Specify a suitable wood for the external cladding, and give **two** reasons for your choice.
- (b) The owner wishes to modify the porch to allow more natural light into the house. Using notes and freehand sketches, show **two** modification to the porch that would allow more natural light to enter the house.
- (c) Discuss **two** reasons why homeowners would wish to build a front porch to their house.

