



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination, 2021

Construction Studies

Theory - Ordinary Level

(150 marks)

Friday, 18 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.

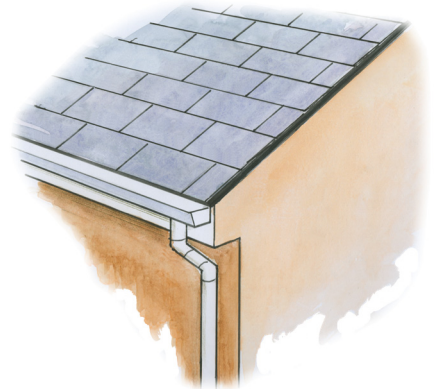
The 2021 examination papers were adjusted to compensate for disruptions to learning due to COVID-19. This examination paper does not necessarily reflect the same structure and format as the examination papers of past or subsequent years.

1. The sketch shows portion of the eaves of a pitched roof. The slated cut roof has a pitch of 30° . The roof is supported on a 400 mm concrete block wall with a full-fill insulated cavity. The slates are fixed to 50 mm $\times$ 30 mm battens, on a breather membrane, supported on 200 mm $\times$ 50 mm rafters. The ceiling joists are 200 mm $\times$ 50 mm with plasterboard fixed beneath. The roof is highly insulated at ceiling joist level.

- (a) To a scale of 1:5, draw a vertical section through the external wall and through the eaves of the pitched roof. On your drawing, show the typical construction details from a level 400 mm below the wallplate, through the wall and eaves. Include the first three courses of slate at eaves.

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

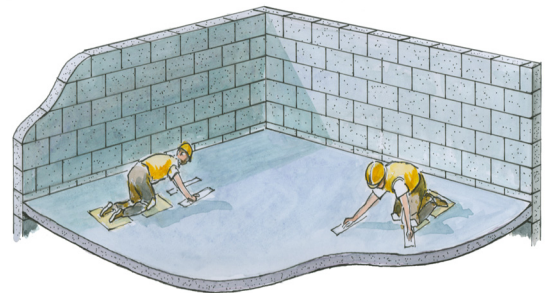
- (b) On your drawing show how rainwater is removed at the eaves.



2. A young couple wish to have a highly insulated ground floor in their new house. The solid ground floor is to have a 100 mm concrete floor slab, finished with a suitable flooring material.

- (a) List **two** advantages of constructing a ground floor with a high level of insulation.

- (b) Using notes and freehand sketches, show **one** suitable method of insulating the solid ground floor of the new house. Specify the type and thickness of insulation.



- (c) The couple must decide on the floor finishes for their house. Recommend a suitable flooring material for the open-plan kitchen, and give **two** reasons for your selection.

3. The public water supply provides households with clean, treated water for domestic consumption.

- (a) Using a single-line labelled sketch, show the pipework required to supply **cold water** from the water main to the kitchen sink and to the water storage tank.

Include the following in your sketch:

- water main
- water meter
- rising main
- pipework to the kitchen sink
- insulated cold water storage tank
- all necessary valves.

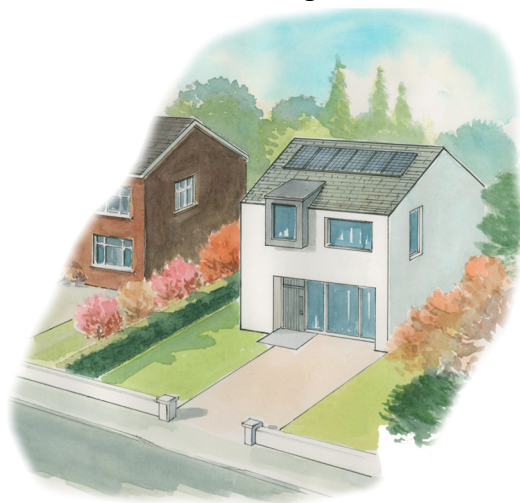


- (b) Discuss **two** advantages of installing a water meter.



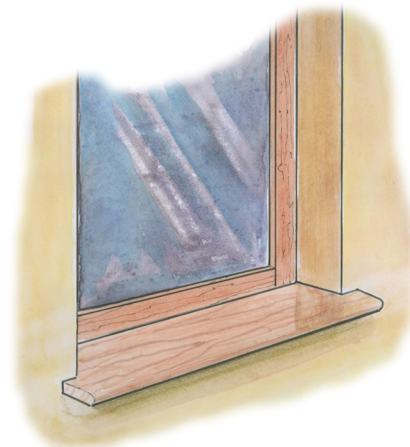
4. The sketch shows a design for a dwelling house which is to be constructed in a town. The owner intends to apply for planning permission to construct this dwelling house.

- (a) Discuss **two** reasons why it is necessary to apply for planning permission to build a new dwelling house.
- (b) Using notes and freehand sketches, describe the information that must be contained in **each** of the following planning documents:
- site notice
 - site location map.
- (c) Discuss **one** advantage and **one** disadvantage of building a dwelling house in a town.



5. The sketch shows portion of a triple glazed wooden window. The window is fixed in a 400 mm concrete block wall with a full-fill insulated cavity. The wall is rendered on both sides. The fixed frame of the window is 120 mm × 80 mm and is thermally broken.

- (a) To a scale of 1:5, draw a vertical section through the external wall and bottom portion of the window. Show the typical construction details from a level 400 mm below to a level 300 mm above the concrete window cill. Include **three** typical dimensions on your drawing.
- (b) Show on your drawing the typical design detailing to prevent water entering at the window cill.



6. (a) Using a large freehand sketch, show the safety sign for **each** of the following personal protection equipment (PPE) items:

- high-visibility vest
- safety boots
- safety helmet.

Give **one** specific reason why each item of personal protective equipment listed above must be worn.



- (b) Describe **two** potential risks to construction workers when working in a deep trench.
- (c) Using notes and a freehand sketch, describe **one** safety precaution that workers should observe when working in a deep trench on a construction site.

7. A draft design for a living room layout with an adjacent kitchen in a new dwelling house is shown. The positions of the windows and a door are included.

- (a) Draw a large freehand sketch of the given design and show on the sketch how the kitchen could be accessed directly from the living room.

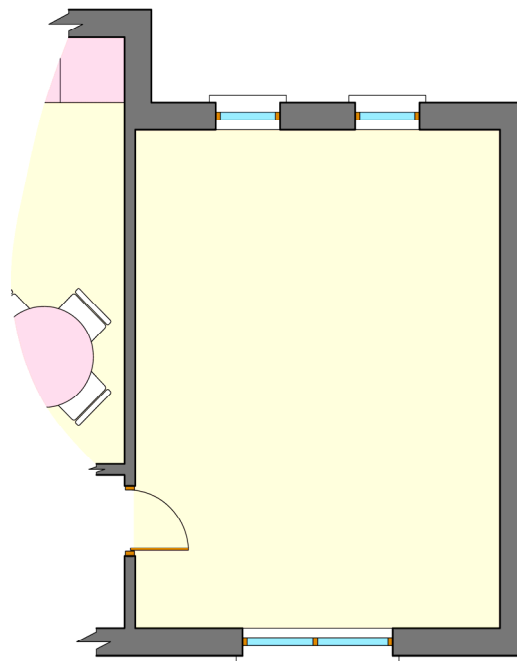
Discuss **one** advantage of including direct access to the kitchen from the living room.

- (b) On the sketch, show your preferred location for **each** of the following in the living room:

- sofa (3 seater)
- stove
- sofa (2 seater)
- television.

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

- (c) Discuss **one** advantage of incorporating a wood-burning stove in a modern living room.



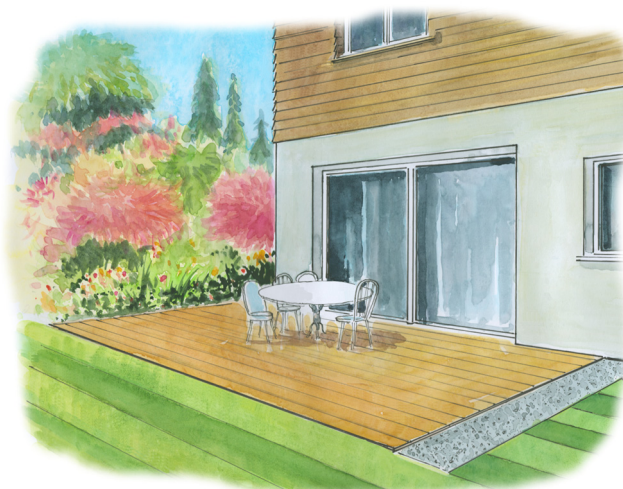
8. Explain, with the aid of notes and freehand sketches, any **five** of the following:

- joist bridging
- steel reinforcement
- biscuit joint
- working drawing
- heat pump
- room thermostat
- rooflight
- ridgeboard
- building energy rating.

9. The sketch shows a space for outdoor living to the rear of a dwelling house. The space has been constructed using softwood decking on wooden joists.

- (a) Specify a suitable applied finish to preserve the decking, and give **two** reasons for your choice.

- (b) The outdoor space needs to be modified so that the occupants can use the space throughout the year. Using notes and freehand sketches, show **two** modifications to the outdoor space that would allow its use during the winter months.



- (c) Discuss **two** advantages for the occupants of creating an outdoor living space.