



Pre-Leaving Certificate Examination, 2024

Name:

School:

Address:

Class:

Teacher:

Construction Studies ***Theory – Ordinary Level***

(200 marks)

Time: 2½ Hours

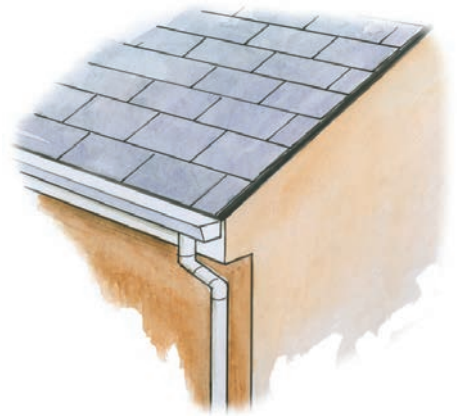
- (a)*** Answer ***any four*** questions.
- (b)*** All questions carry equal marks.
- (c)*** Answers must be written in ink.
- (d)*** Drawings and sketches to be made in pencil.
- (e)*** Write the number of the question distinctly before each answer.
- (f)*** Neat freehand sketches to illustrate written 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 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.

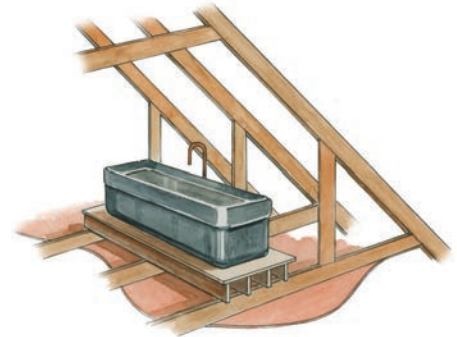
Include **three** typical dimensions on your drawing.

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



2. 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 the water storage tank. The ceiling joists are 200 mm \times 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.



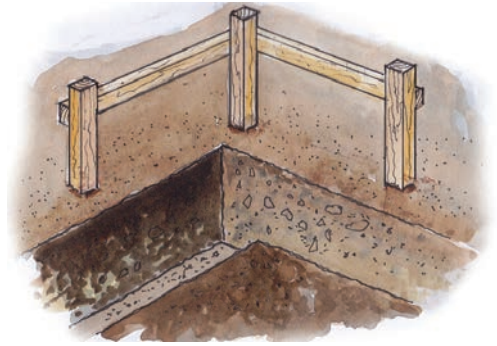
4. The sketch shows one corner of a strip foundation for the external wall of a dwelling house. The external wall is to be a 400 mm concrete block wall with a full-fill insulated cavity.

(a) Discuss **one** environmental reason why a strip foundation is considered the most suitable foundation for this house.

(b) Using notes and freehand sketches, describe how to set out the foundation trench under the following headings:

- profiles
- width and depth of trench
- position of wall on strip foundation.

(c) Using notes and freehand sketches, show how to determine the top surface of the foundation prior to placing the concrete to ensure that the foundation is level throughout.



5. The sketch shows a 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. 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.





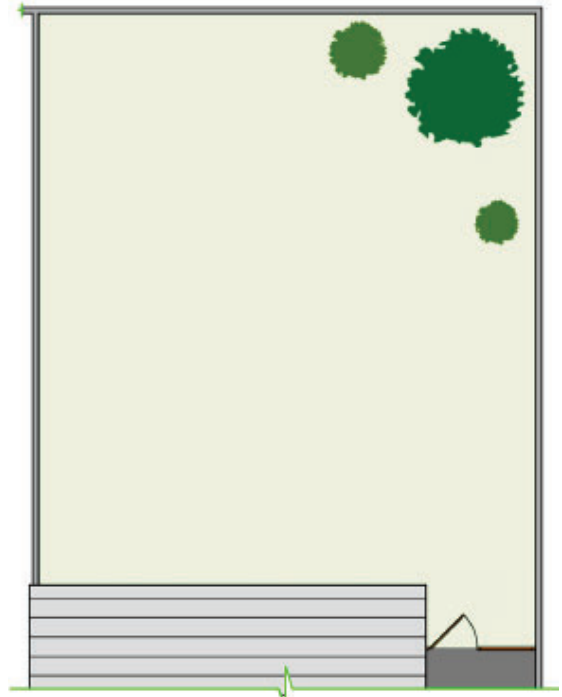
7. The draft design for a rear garden of a semi-detached house is shown. The homeowners wish to create a garden space to meet their family needs. The position of existing trees is shown.

- (a) Discuss **two** reasons why it is important to create a garden space that meets 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 |
| • rooflight | • heat pump | • ridgeboard |
| • smart meter | • evacuated tube | • LED lighting. |

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** modifications 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.

