



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination, 2019

Construction Studies

Theory - Ordinary Level

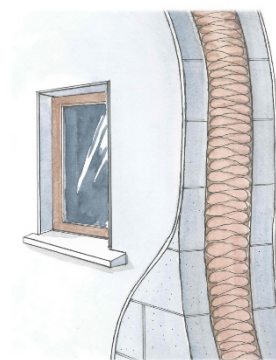
(200 marks)

Friday, 14 June
Afternoon, 2:00 - 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 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.

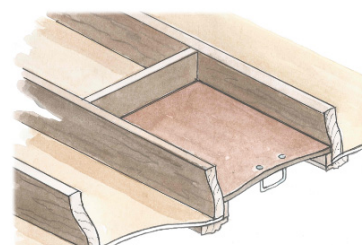
1. The external wall of a dwelling house is a 400 mm concrete block wall with a full-fill insulated cavity. The wall is plastered on both sides. A triple glazed timber casement window is fixed in the external wall, as shown. The fixed frame of the window is 150 mm × 80 mm.

- (a) To a scale of 1:5, draw a vertical section through the top portion of the window. Show the wall, the concrete lintels and the fixed frame of the window. On your drawing, show the typical construction details from a level 300 mm below to a level 400 mm above the concrete lintels. Include **four** typical dimensions.
- (b) Show clearly on your drawing the typical design detailing to ensure that the cavity is closed at the window head.



2. A young couple have bought an old, uninsulated house. They wish to improve the insulation properties of the house and have decided to start by insulating the attic space. The sketch shows the ceiling joists and the trapdoor to the attic. The ceiling joists are 200 mm × 40 mm.

- (a) Draw a large freehand sketch of the triangular attic space. On your sketch show the typical design detailing necessary to highly insulate the attic at ceiling joist level. Recommend a preferred insulation type and give its typical thickness.

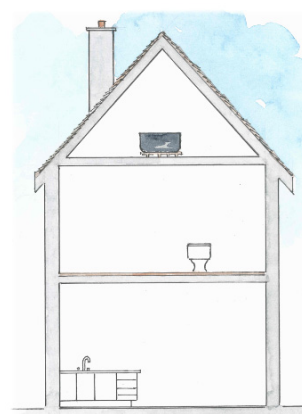


- (b) The trapdoor is also to be insulated and well-sealed. Using notes and freehand sketches show the insulation to the trapdoor. Show also **one** method of sealing the trapdoor.
- (c) Discuss **two** reasons why the couple should begin by insulating the attic space.

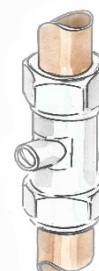
3. (a) A dwelling should have a clean water supply for domestic consumption. Draw a large freehand sketch of the given house and, on your sketch, show the pipework necessary to supply **cold water** to the kitchen sink on the ground floor and to the toilet on the first floor.

Include the following in your diagram:

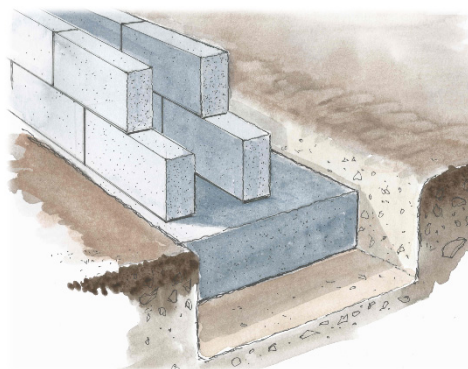
- rising main
- pipework to the kitchen sink
- insulated cold water storage tank
- pipework to toilet cistern
- all necessary valves.



- (b) The sketch shows a valve usually used to turn off the water supply to a toilet. Using notes and freehand sketches show the preferred location of the valve. Give **one** reason for choosing this location for the valve.
- (c) Discuss **one** advantage of installing a dual-flush toilet.



4. The sketch shows a reinforced concrete strip foundation, and a 400 mm cavity wall for a new house.



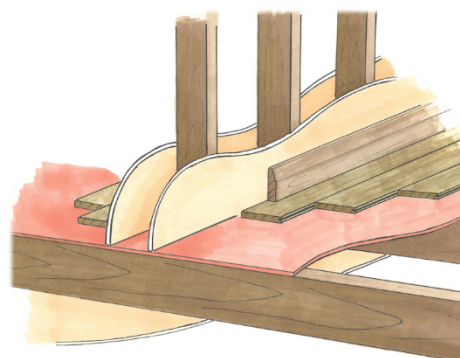
- (a) Using notes and freehand sketches show the typical construction details of the strip foundation supporting the concrete block wall. Indicate the position of the wall on the foundation **and** the location of the steel reinforcement in the foundation.

Include **three** typical dimensions in your sketch.

- (b) Using notes and freehand sketches, show **one** method of connecting the inner and outer leaves of the wall.

- (c) Discuss **two** advantages of using ready-mixed concrete in the foundations of a dwelling house.

5. A non-loadbearing stud partition separates two bedrooms on the first floor of a dwelling house, as shown. The partition is supported on 225 mm × 50 mm flooring joists, and the first floor is a floating tongue and groove wooden floor on 20 mm plywood decking, with a plasterboard ceiling beneath.



- (a) To a scale of 1:5 draw a vertical section, parallel to the joists, through the floor and the stud partition. Show the typical construction details from the plasterboard ceiling, through the first floor and the stud partition up to a level 400 mm above the finished floor. Show a floor width of 500 mm on each side of the partition.

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

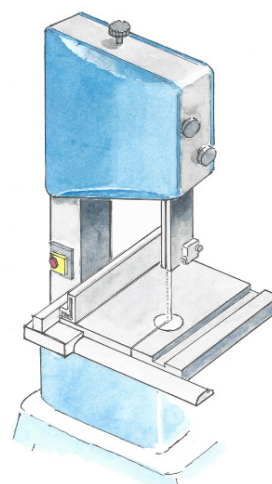
- (b) On your drawing show the position of the insulation in the partition.

6. (a) State **two** specific safety precautions to be observed in the Construction Studies classroom in **each** of the following situations:

- using a contact adhesive to glue veneers
- using a battery powered screwdriver.

- (b) Using notes and freehand sketches, describe **three** specific safety precautions to be observed when operating a bandsaw to cut a piece of wood in the Construction Studies room. Give **one** reason for each safety precaution outlined.

- (c) Discuss **two** reasons why safety instruction is necessary for all students prior to using machinery in a Construction Studies room.



7. A draft design for a small open-plan kitchen and dining area for a new house is shown. The positions of the window and doors are included.

- (a) Draw a freehand sketch of the given design and show your preferred location for **each** of the following in the kitchen area:

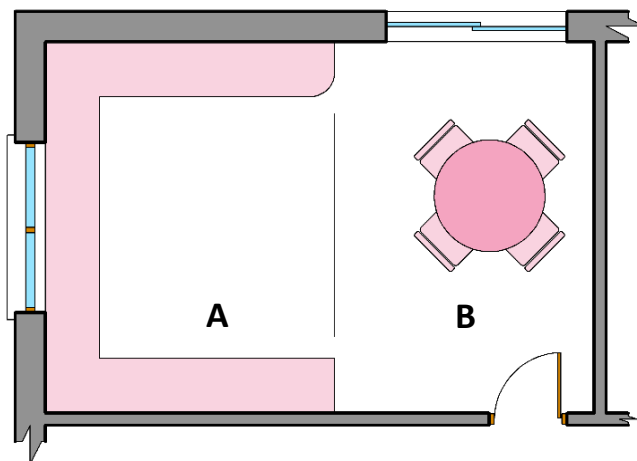
• *cooker* • *fridge* • *sink*.

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

- (b) Select a suitable floor type for the kitchen area **A** and another appropriate floor type for the dining area **B**.

Discuss **one** reason for **each** floor type selected.

- (c) Draw a sketch of an outline design showing the position of an island unit suitable for the kitchen area **A**. Discuss **one** advantage of including an island unit in the kitchen.



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

- carbon monoxide alarm
- grab rail
- furniture castor
- laminated safety glass
- eaves gutter
- balusters
- sapwood
- bridle joint
- fluorescent lighting.

9. The sketch shows an eco-friendly home office in a garden setting. The office 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 home office is to be modified to provide greater views of the surrounding garden. Using notes and freehand sketches, show **one** modification to the existing design that would increase the visual connection between the office and the garden.



- (c) Discuss **two** advantages for the home office user of increasing the visual connection with the surrounding garden.