



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination, 2023

Construction Studies

Theory - Ordinary Level

(200 marks)

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

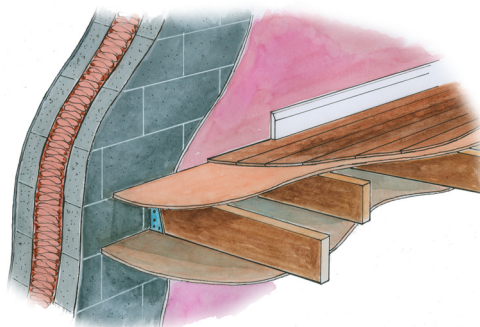
- (a)*** Answer ***any four*** questions.
- (b)*** All questions carry equal marks.
- (c)*** Answers must be written in ink.
- (d)*** Drawings and sketches are to be made in pencil.
- (e)*** Write the number of the question distinctly before each answer.
- (f)*** Neat freehand sketches to illustrate 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 external wall and timber first floor 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 first floor joists are 225 mm × 50 mm and are fixed to the external wall using joist hangers. The floor is finished with a tongued and grooved hardwood floor, on 20 mm plywood decking with a plasterboard ceiling beneath.

- (a) To a scale of 1:5, draw a vertical section through the external wall and first floor. On your drawing show the typical construction details from a level 400 mm below the plasterboard ceiling to a level 400 mm above the hardwood floor. Show an internal floor width of 900 mm. Include **four** typical dimensions.



- (b) On your drawing, show the typical design detailing to connect the inner and outer leaves of the external wall.

2. The sketch shows an old uninsulated dwelling house. The homeowner has received a grant to carry out energy upgrades to their house. They have decided to start by adding external insulation to the walls of the house.

- (a) Discuss **two** reasons why energy upgrade grants are available for old houses.
- (b) Using notes and freehand sketches, show **one** suitable method of applying an external insulation system to a house. Specify the type and thickness of insulation.
- (c) On a separate sketch show, using notes and freehand sketches, **one** other possible energy upgrade the homeowner could carry out to their house.



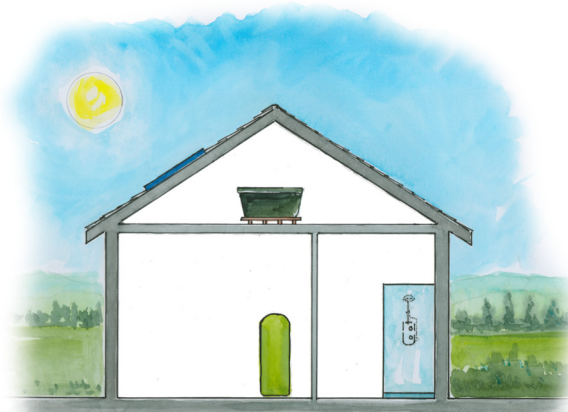
3. The sketch shows a dwelling house which has a solar collector on the roof. The solar collector provides hot water for the household.

- (a) Draw a large freehand sketch of the given house. On your sketch, show the pipework necessary to connect the solar collector to the hot water cylinder and supply **hot water** to a shower.

Include the following in your sketch:

- flow and return pipes
- expansion vessel
- pipework to shower
- all necessary valves.

- (b) Discuss **two** considerations when deciding the location of solar panels on a house.



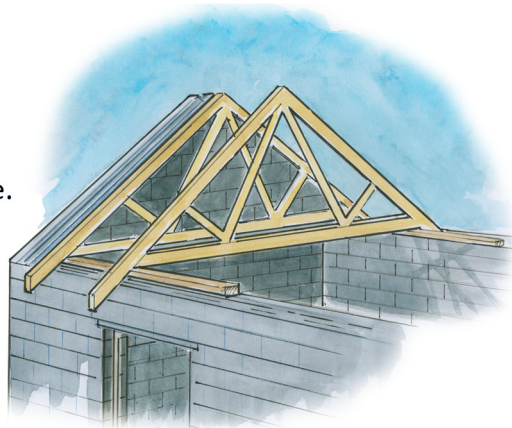
4. The sketch shows the roof of a house under construction. The homeowners have decided to construct the roof using prefabricated trussed rafters.

(a) Discuss **two** advantages of using prefabricated trussed rafters to construct a roof.

(b) Using notes and a freehand sketch, show the typical construction details of how a trussed rafter is secured on the external wall of a house.

Include the following in your sketch:

- external wall
- wallplate
- trussed rafter
- nail plate
- truss clip.

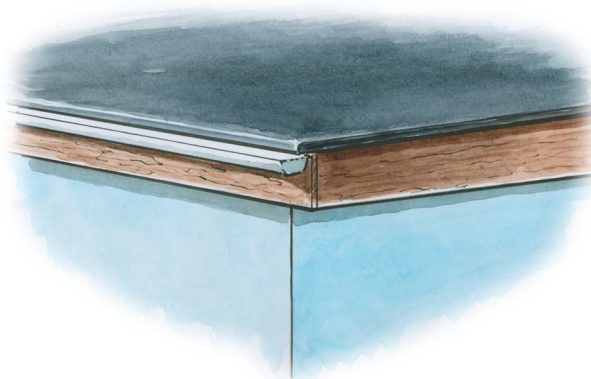


(c) Specify a suitable roof finish material for the house, and give **two** reasons for your choice.

5. The sketch shows the eaves of a flat roof. The roof is covered with a waterproof membrane, on 150 mm rigid insulation, on a 20 mm plywood deck supported by sloping furring pieces. The 200 mm × 50 mm timber joists have a plasterboard ceiling beneath. The roof is supported on a 400 mm concrete block wall with a full-fill insulated cavity. The wall is rendered on both sides.

(a) To a scale of 1:5, draw a vertical section through the external wall and the eaves of the flat roof. On your drawing, show the typical construction details from a level 450 mm below the wallplate, through the external wall and eaves. Show 900 mm length of roof joist.

(b) On your drawing show the typical design detailing to ensure that the cavity is closed at wallplate level.

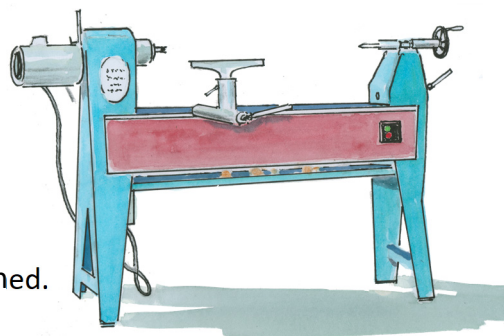


6. (a) State **two** specific safety precautions to be observed in the Construction Studies classroom in **each** of the following situations:

- using a jigsaw
- using epoxy adhesive.

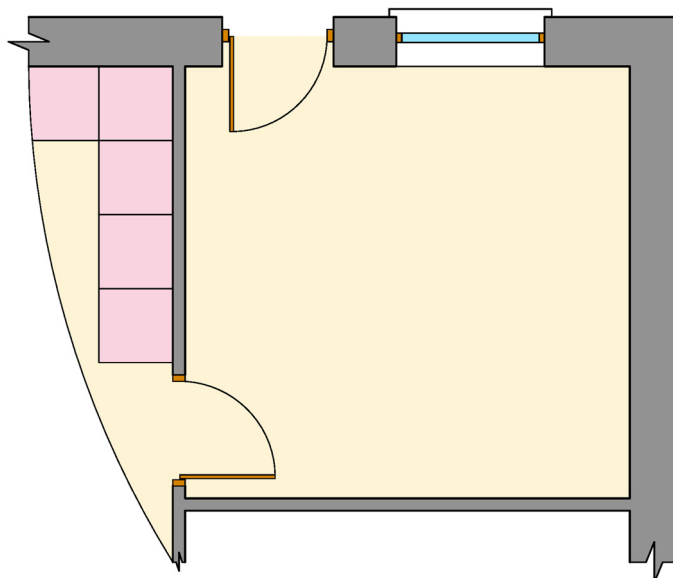
(b) Using notes and freehand sketches, describe **three** specific safety precautions to be observed when woodturning on a lathe. Give **one** reason for each safety precaution outlined.

(c) Discuss **two** reasons why it is important to maintain an organised and tidy environment in a Construction Studies room.



7. The draft design for a utility room in a new dwelling house is shown. The positions of the external door, window and a door to the kitchen are included.

- (a) Discuss **two** advantages of including a large utility room in the design of a new home.
- (b) Draw a large freehand sketch of the given design and show your preferred location for **each** of the following in the utility room:
- sink
 - washing machine
 - storage units
 - seating / boot area.



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

- (c) Specify a suitable floor covering for the utility room and give **two** reasons for your choice.

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

- concrete mixer
- smart radiator valve
- ridge tile
- triple glazing
- balusters
- cedar cladding
- bridle joint
- wood pellet stove
- floor screed.

9. The sketch shows a front entrance to a semi-detached house. The owners wish to modify the front entrance to make it fit for use by a person with limited mobility.

- (a) Specify a suitable material for a new front door, and give **two** reasons for your choice.
- (b) Using notes and freehand sketches, show **two** modifications to the front entrance area that would allow access to the house for a person with limited mobility.
- (c) Discuss **two** reasons why the owners would wish to create a front entrance that is accessible for all.

