



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination, 2020

Construction Studies

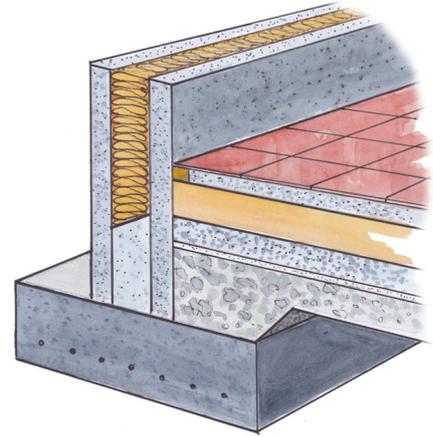
Theory - Ordinary Level

(200 marks)

2 hours 30 minutes

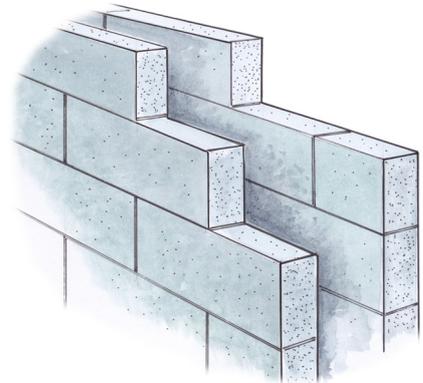
- (a)*** Answer **Question 1** and **three** other questions.
- (b)*** All questions carry equal marks.
- (c)*** Answers must be written in ink.
- (d)*** Drawings and sketches are to be made in pencil.
- (e)*** Write the number of the question distinctly before each answer.
- (f)*** Neat freehand sketches 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. A dwelling house has a 400 mm concrete block wall with a full-fill insulated cavity supported on a traditional strip foundation. The wall is plastered on both sides. The insulated concrete ground floor is finished with 20 mm floor tiles as shown.



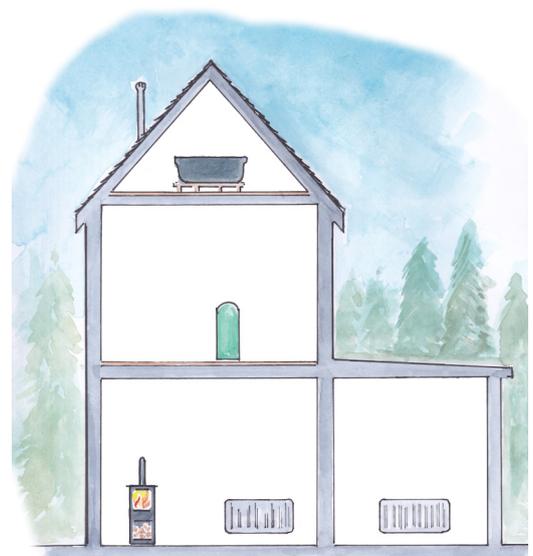
- (a) To a scale of 1:5, draw a vertical section through the strip foundation, external wall and ground floor. On your drawing show the typical construction details from the bottom of the foundation to a point 200 mm above finished floor level. Show an internal floor width of 900 mm and include **four** typical dimensions.
- (b) On your drawing, show the typical design detailing to prevent dampness entering the building through the floor.

2. The proposed external wall for a new house has a 100 mm concrete block outer leaf, a 200 mm cavity and a 100 mm concrete block inner leaf as shown.



- (a) Using notes and freehand sketches, show **one** suitable method of insulating the proposed cavity. Specify the type and thickness of insulation.
- (b) List **two** advantages of installing insulation in the cavity.
- (c) On a separate sketch show, using notes and freehand sketches, **one** method of providing additional insulation to this wall to further improve its thermal insulation properties.

3. (a) A wood-burning stove can be used to heat radiators for a dwelling house. Draw a large freehand sketch of the given house and, on your sketch, show the pipework necessary to supply **hot water** from the stove to the ground floor radiators and also heat the water in the cylinder on the first floor.



Include the following in your sketch:

- wood-burning stove
- hot water cylinder
- pipework to cylinder
- expansion tank / vessel
- pipework to radiators
- all necessary pumps and valves.

- (b) The installation of an underfloor heating system is now an alternative to radiators. Discuss **one** advantage of installing an underfloor heating system.

4. Careful planning is required to manage waste on a construction site so as to reduce, re-use and recycle construction materials. The sketch shows one possible waste management method used to sort materials on a site.



- (a) Discuss **two** reasons why a construction company should have a waste management plan for their site.
- (b) Name **two** construction materials that could be recycled and then re-used on a construction site. Give **one** suitable re-use for each material.
- (c) Using notes and a freehand sketch, show **one** other method of sorting and storing waste materials on a construction site.

5. The sketch shows portion of a pitched roof including the ridge. This traditional slated cut roof has a pitch of 45° . The slates are fixed to 50 mm × 20 mm battens, on a breather membrane, supported on 200 mm × 50 mm rafters. The roof is highly insulated at collar tie level with an insulated plasterboard ceiling beneath.

- (a) To a scale of 1:5, draw a vertical section through the roof at the ridge. Show the typical construction details from the top of the ridge to a level 100 mm below the collar ties. The collar ties are positioned 900 mm below ridge level. Include three courses of slate at the ridge.



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

- (b) On your drawing show **one** method of ventilating the roof.

6. (a) Using large freehand sketches, show **three** safety signs highlighting the use of personal protection equipment (PPE) that must be worn by all workers on a construction site.

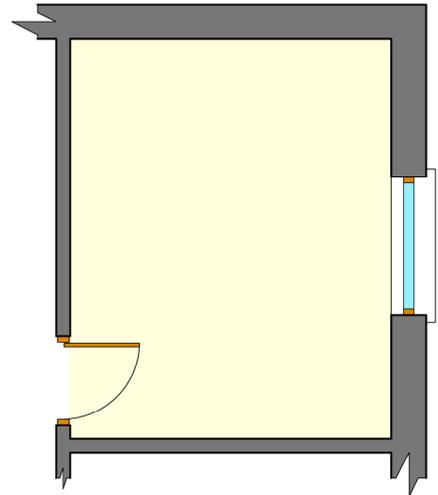
For **each** sign, state how the personal protection equipment protects workers on the site.

- (b) Using notes and sketches, describe **two** safety precautions that workers must follow when working at height on a construction site.

- (c) Give **two** reasons why all workers must undertake a safety training course prior to working on a construction site.



7. A draft design for a bathroom, suitable for a person with limited mobility is shown. The position of a window and a door are included.

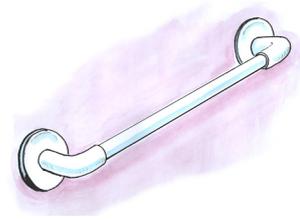


(a) Draw a freehand sketch of the given design and show your preferred location for **each** of the following in the bathroom:

- toilet
- wash basin
- shower area.

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

(b) The homeowner has decided to install grab-rails, like that shown, in the bathroom to aid ease of use for all users. Using notes and freehand sketches show **two** possible locations for grab-rails.



Give **one** reason for each location.

(c) Discuss **one** advantage of designing a bathroom suitable for a person with reduced mobility.

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

- stud partition
- domino joint
- slump test
- dynamic glass
- pyrite
- pile foundation
- trimmer
- butt hinge
- solar panel.

9. The sketch shows a semi-detached house with an extension to the rear. The extension is finished externally with wooden cladding.

(a) Discuss **two** reasons why a homeowner would build an extension to their house.

(b) Using notes and freehand sketches, show **two** modifications to the extension that would allow more natural light enter the dwelling.

(c) Discuss **two** advantages for the occupants by increasing the amount of natural light entering the dwelling.

