



Leaving Certificate Examination, 2016

Construction Studies

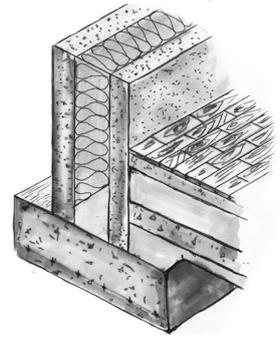
Theory - Ordinary Level

(200 marks)

Friday, 17 June
Afternoon, 2:00 to 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 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 external concrete block wall with a 200 mm full-fill insulated cavity. The ground floor is an insulated concrete floor with a 20 mm floating tongue-and-groove hardwood finish, as shown.

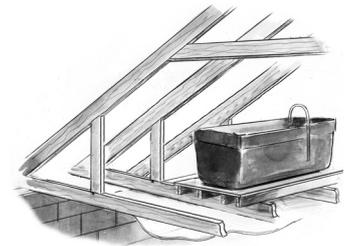


- (a) To a scale of 1:5, draw a vertical section through the strip foundation, the external wall and the ground floor. Show the typical construction details from the bottom of the foundation to a level 400 mm above finished floor. Show the position of the radon barrier and include **four** typical dimensions on your drawing. *Show 1.0 metre width of floor.*
- (b) On your drawing, show the typical design detailing to prevent the formation of a thermal bridge at the junction of the external wall and the floor.

2. The owners of a house have decided to insulate their house over a number of years, starting with the attic space. The rafters and ceiling joists are 200 mm × 40 mm. The water storage tank is in the attic, as shown.

- (a) Draw a large freehand sketch of the attic space. On your sketch, show the typical design detailing necessary to insulate, to a high standard, **each** of the following:

- attic space
- water storage tank *and*
- pipework.



- (b) Discuss **two** reasons why the attic space is chosen as the first area to be insulated.

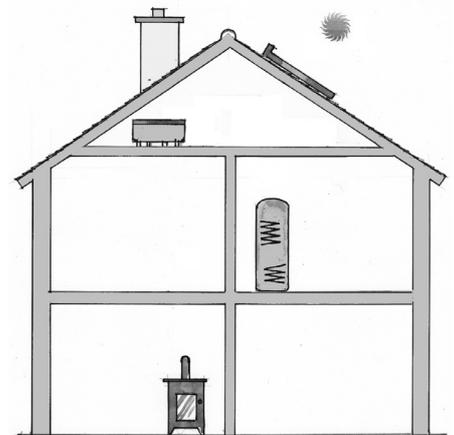
3. The sketch shows a wood burning stove which is combined with a solar collector to provide hot water for a dwelling house. Also shown are a dual-coil hot water cylinder and the expansion tank in the attic.

- (a) Draw a large freehand sketch of the given diagram and also include the main cold water storage tank in the attic. Show the pipework required to connect the stove to the cylinder. Include the following on your sketch:

- rising main and the main cold water storage tank
- hot water cylinder and expansion pipe
- stove and pipework from stove to cylinder
- all necessary valves.

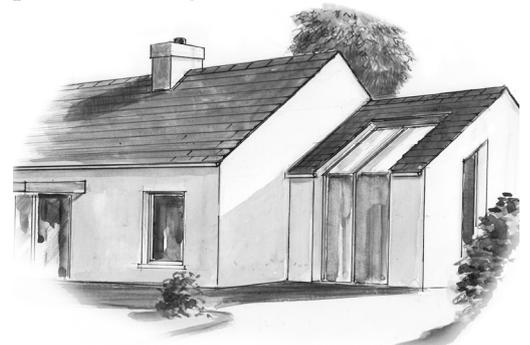
- (b) On the same sketch, show also the pipework necessary to connect the solar collector on the roof to the cylinder.

- (c) Discuss **two** advantages of including a solar collector to provide domestic hot water for a house.



4. The owners intend to apply for planning permission to build a sunspace on to the gable end of their house, as shown in the sketch.

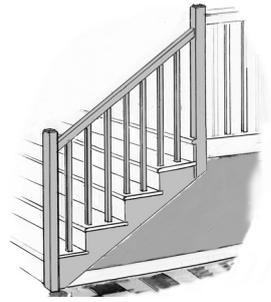
- (a) Discuss **two** reasons why it is necessary to apply for planning permission to build the sunspace shown.
- (b) State the information that must be contained in **each** of the following planning documents:
- site layout map
 - planning notice in newspaper.



- (c) Discuss **one** reason why the planning authority allows the public to view all planning documents after a planning application is submitted.

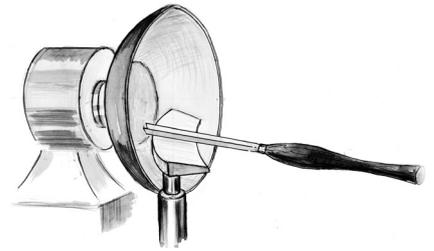
5. The sketch shows a portion of a cut string wooden stairs. The stairs leads to a small landing as shown. The newel post is 100 mm × 100 mm and the balusters are 50 mm × 50 mm. The rise of each step is 175 mm.

- (a) To a scale of 1:5, draw a vertical section through the bottom **three** steps of the stairs. Show the cut string, newel post, handrail and balusters.
- (b) On your drawing, show how **one** baluster is fitted securely to the thread.



6. (a) Outline **two** specific safety precautions to be observed in the Construction Studies room in **each** of the following situations:
- using a scalpel to cut modelling card
 - carrying a chisel
 - using a contact adhesive.

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

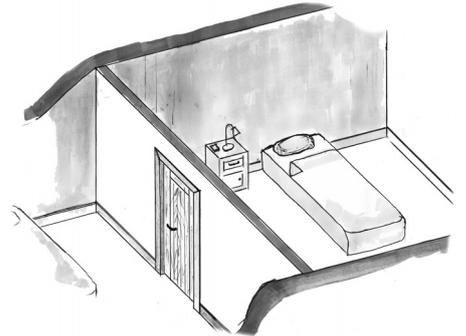


7. A non load-bearing timber stud partition with a plasterboard finish separates two bedrooms on the ground floor of a house. A solid wooden door is fitted in the stud partition, as shown.

- (a) Using notes and freehand sketches show the typical construction details of the stud partition. Show clearly the studwork necessary to accommodate the doorframe. Indicate on your sketch the names and typical sizes of all components.

- (b) On a separate annotated sketch, show **one** method that would help reduce the transmittance of sound through the stud partition.

- (c) Describe briefly **one** method of providing a surface finish to the plasterboard prior to painting.

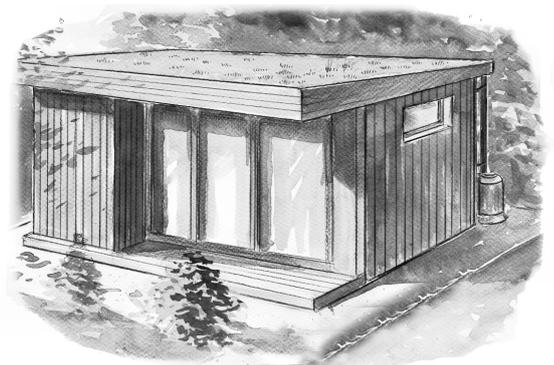


8. Explain, with the aid of notes and freehand sketches, any **five** of the following:

- | | | |
|------------------|---------------------------|----------------|
| • lever valve | • mortice and tenon joint | • cob wall |
| • thermal bridge | • dual flush toilet | • smart meter |
| • solar gain | • low-e glazing | • access ramp. |

9. The sketch shows an eco-friendly garden room with an external wooden cladding.

- (a) Specify a suitable wood for the external cladding, and give **two** reasons for your choice of wood.
- (b) Recommend a suitable applied finish to preserve the external cladding. Using notes and freehand sketches, describe the steps involved in preparing the wood and in applying the recommended surface finish.
- (c) Discuss **two** features of the design that ensure the garden room is eco-friendly.



Blank Page