AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA

LEAVING CERTIFICATE EXAMINATION, 2002

CONSTRUCTION STUDIES – PART 1 (THEORY)

ORDINARY LEVEL

DAY – DATE – TIME

(200 marks are allotted to this paper)

INSTRUCTIONS

(a) Answer **Question 1** and **three** other questions.
(b) Answers must be written in ink; drawings and sketches to be made in pencil.
(c) Write the number of the question distinctly in the margin of the paper before each answer.
(d) Freehand sketches or diagrams to illustrate written descriptions should be made.
(e) The name, sizes, dimensions and other necessary particulars of each material indicated must be noted on the drawing.
(f) *All questions carry equal marks.*

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1. To a scale of 1:5 draw a vertical section through a suspended timber ground floor, together with an external load bearing concrete block wall. The wall is of the standard 300 mm insulated cavity type and is plastered on both sides.

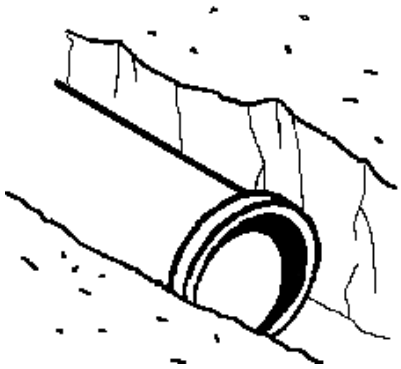
The section is to be taken from the bottom of the foundation to 300 mm above the level of the floor and should show all relevant constructional details.

2. **(a)** Using a **clear, labelled sketch** show the pipework and valves necessary to supply cold water to a Bath and Wash Hand Basin.

(b) Describe using ***notes and neat freehand sketches***, a design detail of a precaution that could be taken to protect copper pipework from the effects of severe frost.

3. Describe using ***notes and neat freehand sketches*** how to set-out and lay a drain, as shown, from a domestic dwelling to a Septic Tank, under **each** of the following headings:

(i) Excavation of Trench;
(ii) Depth & Width of Trench;
(iii) Safety;
(iv) Slope or Gradient;
(v) Pipework;
(vi) Backfilling.



4. **(a)** To a scale of 1:10 draw a vertical section through a concrete window cill in a standard 300 mm insulated, cavity, block wall.

(b) Include in your drawing design details, which will help prevent the following;-

(i) water from reaching the wall immediately under the cill;
(ii) dampness from reaching the inner leaf of the cavity wall.

5. **(a)** In relation to concrete work explain in detail **any three** of the following terms:

(i) Coarse Aggregate;
(ii) Fine Aggregate;
(iii) Water / Cement Ratio;
(iv) Slump Test;
(v) Reinforced Concrete.

(b) Give **two** examples of where reinforced concrete may be in the construction of a domestic dwelling.

Write a short note on **each**.

6. **(a)** The following are four safety signs that are commonly used in the construction industry.

(i) (ii) (iii) (iv)

State clearly what is meant by **each** of the above.

Two of the above signs are circular in shape and two are triangular. Briefly describe the meaning of these different shapes.

(b) Using notes and ***neat freehand sketches*** describe **three** safety precautions that should be observed when using scaffolding on a construction site and briefly explain the reason for **each**.

7. Explain with the aid of notes and ***neat freehand sketches*** any **five** of the following as they relate to construction:-

(i) Upper Floor Joist;
(ii) Solid Strutting or Bridging;
(iii) Profile;
(iv) Damp-Proof Course (D.P.C.);
(v) Purlin;
(vi) Tongued and Grooved Flooring Boards;
(vii) Plasterboard.

8. **(a)** Explain in detail the sequence of operations required, for preparing and painting, new wood for an external use such as the fascia board shown in the diagram.

(b) List and explain **two** safety precautions that should be observed when applying preservatives to wood.

9. **(a)** Using ***notes and neat freehand sketches*** show the location of thermal insulation in **each** of the following:-

(i) a pitched roof;
(ii) an external cavity wall.

(b) State the type of insulation, and the thickness, that should be used in **each** of the above.

Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination, 2003

Construction Studies

Theory - Ordinary Level

(200 Marks)

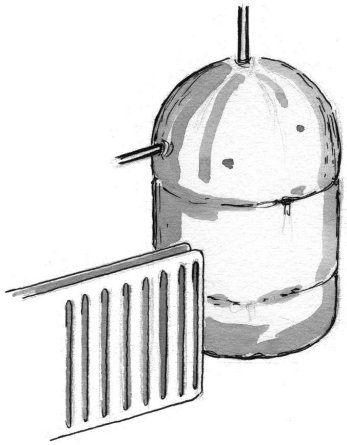
Wednesday 18 June
Afternoon, 2.00 to 4.30

(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. To a scale of 1:10 draw a vertical section through the eaves of a tiled roof, supported on a 300mm external block wall with an insulated cavity.

The section should show the top of the cavity wall and also include the wallplate, rafter, joist, fascia, soffit and three courses of roof tiles.

2. The sketch shows a radiator and a copper cylinder suitable for a domestic dwelling.



(a) Draw a neat single-line labelled diagram showing the pipework necessary to connect a copper cylinder, a boiler and two radiators in a domestic central heating system.

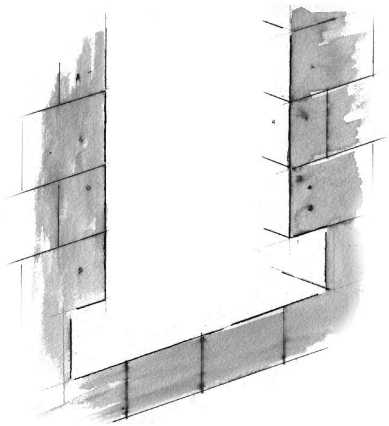
(b) Using arrows, indicate the direction of the flow of water in the system.

3. **(a)** Describe the procedures involved in removing gloss paint from an external wooden door.

(b) List **three** safety precautions that should be observed when removing paint or varnish.

(c) Describe the sequence of operations involved in the surface preparation and in the application of a gloss paint finish to a new external wooden door.

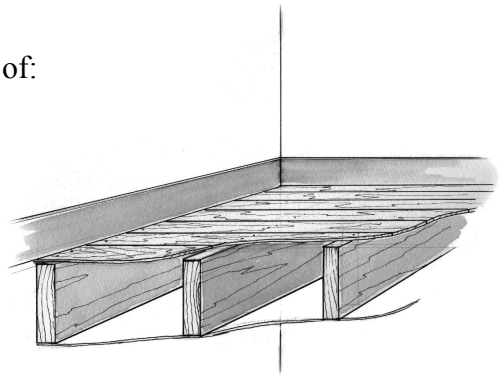
4. **(a)** Using notes and ***neat freehand sketches*** show how a window opening, as shown in the sketch, is formed in a 300mm concrete block wall with an insulated cavity. Show the details at the top and sides of the window opening.



(b) On a separate sketch, show the correct position of a window frame in the opening and on the sketch show a method of securing the window frame to the wall.

5. The accompanying sketch shows a suspended timber first floor suitable for a dwelling house. The floor consists of wooden joists, tongued and grooved flooring boards with a plasterboard ceiling beneath.

Using notes and ***neat freehand sketches***, show a method of:



(a) supporting the flooring joists at an external block cavity wall;

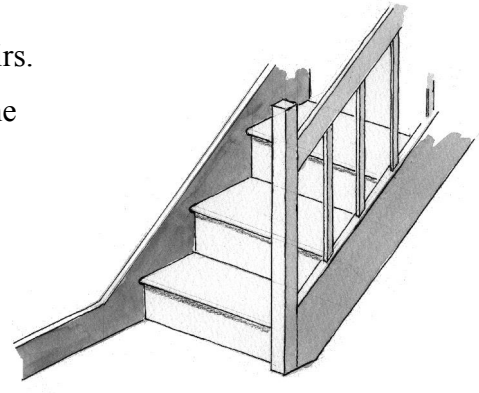
(b) bridging/strutting the flooring joists.

6. **(a)** Give **two** reasons why it is necessary to provide thermal insulation in a domestic dwelling.

(b) Using notes and ***freehand sketches*** show a means of providing thermal insulation in each of the following locations:
(i) Pitched roof;
(ii) External wall;
(iii) Concrete ground floor.

(c) Suggest a suitable insulation material for **each** of the above locations.

7. The sketch shows a portion of a closed-string wooden stairs.



(a) To a scale of 1:10 draw a vertical section through the bottom three steps of the stairs.
(It is not necessary to show the newel post and handrail).

(b) On a separate sketch show a method of joining the risers and treads to the string.

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

(i) Hardcore;
(ii) Vapour Barrier;
(iii) Sleeper Wall/Dwarf Wall;
(iv) Soaker;
(v) Compression Joint;
(vi) Stepped Foundation;
(vii) Foil-backed Plasterboard.

9. List and explain **two** appropriate safety precautions that must be observed in each of the following situations:

(a) Excavating a foundation trench for a dwelling house;
(b) Using an extension ladder during the construction of a house;
(c) Visiting a construction site;
(d) Slating a pitched roof.

Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2004

Construction Studies

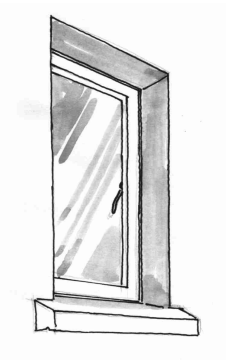
Theory - Ordinary Level

(200 Marks)

Wednesday 23 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 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 timber casement window is fixed in a standard 300mm external block wall with an insulated cavity, as shown in the sketch. The wall is plastered on both sides.
To a scale of 1:2 *(half full size)* draw a vertical section through the lintel, window head and sash. Show all the construction details from 350mm above to 200mm below the top of the window frame.

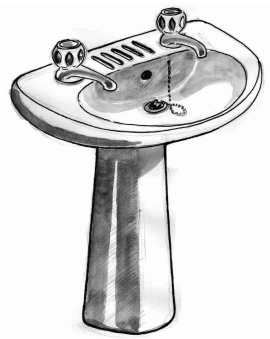


2. **(a)** Using notes and ***neat freehand sketches*** show a foundation suitable for an external wall of a single storey dwelling house.
Name the foundation type and give its dimensions relative to the width of the wall.

(b) On the sketch, show and label a design detail which would help increase the strength of the foundation.

3. **(a)** Using a clear ***labelled diagram***, sketch a system to provide **hot water** to a wash hand basin, as shown in the sketch.
Include the following in your diagram:

- water storage tank;
- hot water cylinder;
- all pipework;
- necessary valves.



(b) Describe, using notes and neat freehand sketches, **one** design detail that should be included to reduce heat loss from the hot water system.

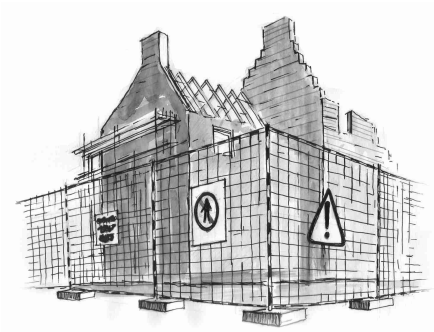
4. The roof of a dwelling house is covered with concrete roof tiles. The roof is of traditional construction and has a pitch of 30 degrees.

(a) To a scale of 1:5, draw a section through the roof, to include the ridge board, rafters, collar tie and tiling. Show the construction details from the top of the ridge to 150mm below the collar tie. Label all the roof components and give their sizes.

(b) Suggest a suitable preservative that may be applied to the roof members and list **two** safety precautions that should be observed when applying the preservative.

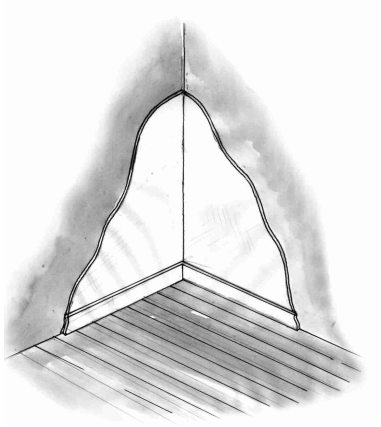
5. **(a)** List **two** specific safety precautions to be observed in each of the following situations:

- Placing fibreglass insulation in the attic space of a dwelling house;
- Wiring a three-pin plug;
- Erecting a scaffold;
- Visiting a construction site when trenches are being excavated using machinery.



(b) Give **one** reason why each safety precaution listed should be observed.

6. Plasterboard and insulation are to be fixed, as a dry lining, to the inner surface of an external block wall.



(a) Using notes and ***neat freehand sketches***, show **one** method of fixing the dry lining to the wall.

(b) Give **two** reasons why it may be necessary to fix dry lining to the external walls of an old house.

(c) Describe the preparation of the surface of the dry lined wall prior to the application of a paint finish.

7. Explain with the aid of notes and ***neat freehand sketches*** any **five** of the following terms:

- Soffit;
- Sub - floor;
- Handrail;
- Newel post;
- Purlin;
- Gully trap;
- Radon barrier.

8. **(a)** Show, using notes and ***neat freehand sketching,*** the construction details of an insulated solid concrete ground floor of a domestic dwelling.

(b) Include and label in your sketch a design detail which will prevent moisture reaching the inside of the building at floor level.

(c) Recommend a floor covering for the concrete ground floor of a kitchen area and give **two** reasons for your choice of material.

9. **(a)** Explain in detail **three** of the following terms as they apply to concrete:

- Aggregates;
- Batching;
- Formwork;
- Slump test;
- Curing.

(b) Describe **three** locations where pre-cast concrete components are used in the construction of a dwelling house.

(c) Explain **three** advantages of using pre-cast concrete components.

Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2005

Construction Studies

Theory - Ordinary Level

(200 Marks)

Wednesday 22 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 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 flush panel door is fixed in a standard 100mm internal solid concrete block wall of a house, as shown in the sketch. The wall has a hardwall plaster finish on both sides. The house has an insulated solid concrete ground floor.

To a scale of 1:5, draw a vertical section through the foundation, floor and door. The section should show all the constructional details from the bottom of the foundation of the internal block wall to 600mm above finished floor level.

2. A non load-bearing timber stud partition with plasterboard finish separates two bedrooms on the first floor of a house.

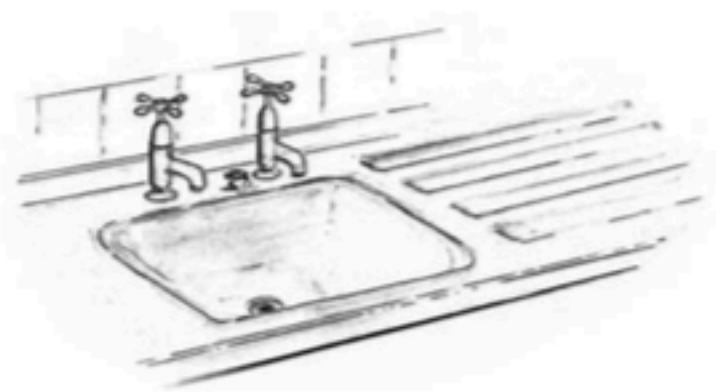
(a) Using notes and ***neat freehand sketches***, describe the construction of the stud partition. Indicate on the sketches the names and sizes of all parts.

(b) Describe **two** methods of providing a surface finish to the plasterboard prior to painting.

(c) Recommend one of the finishes described at **(b)** and give **two** reasons for recommending this finish.

3. **(a)** Using a clear ***labelled diagram***, sketch a system to provide **hot water** to a kitchen sink, as shown in the sketch.
Include the following in your diagram:

- rising main and water storage tank;
- hot water cylinder;
- all pipework for hot water;
- necessary valves.

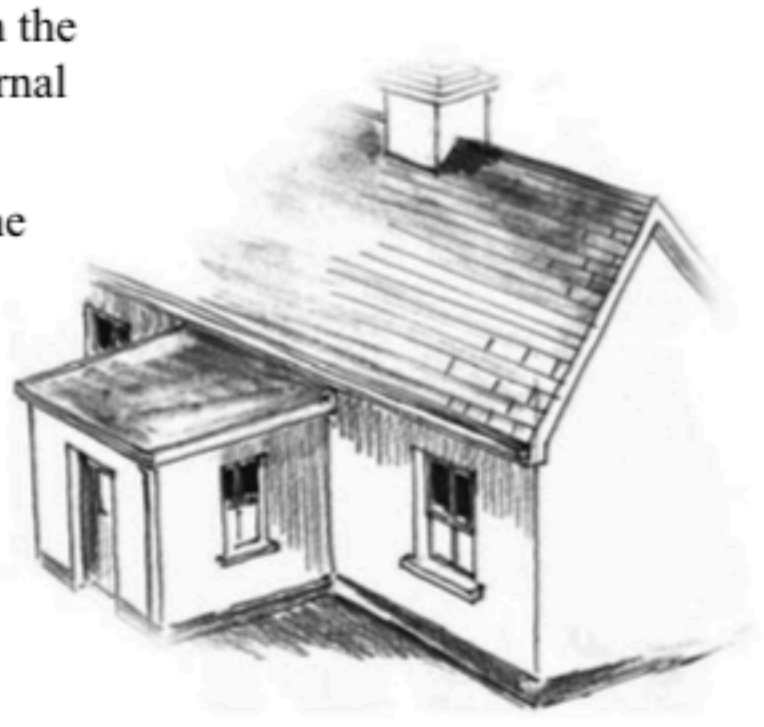


(b) Describe, using notes and ***neat freehand sketches***, **one** design detail that prevents odours entering the kitchen from the waste discharge system of the kitchen sink.

4. A utility room extension to a dwelling house, as shown in the sketch, has a timber flat roof supported on a 300mm external concrete block wall with an insulated cavity.

(a) To a scale of 1:5, draw a vertical section through the eaves of the flat roof. The section should show all the constructional details from 400mm below the wall plate to the top of the roof surface. Show one metre length of roofing joist. Label all the roof components and give their sizes.

(b) Indicate on the drawing **one** design detail that ensures adequate ventilation of the roof at eaves level.



5. **(a)** List **two** specific safety precautions to be observed in each of the following situations:

- Drilling a hole,10mm in diameter, through a 6mm acrylic sheet;
- Using a jig saw to cut a curved shape in 6mm plywood;
- Using an electric drill out-of-doors;
- Placing a ladder against an external wall of a house.

(b) Give **one** reason why each safety precaution listed should be observed.

6. A two-pipe central heating system is widely used in domestic dwellings.

(a) Draw ***a neat freehand sketch*** of **two** radiators in a two-pipe heating system and show clearly how both radiators are connected in the two-pipe system.

(b) List **two** advantages of installing a two-pipe central heating system in a domestic dwelling.

(c) The sketch shows a radiator for use in a domestic dwelling. Draw ***a neat freehand sketch*** of **one** of the valves to be fitted to this radiator and state clearly the function of the valve.

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

- Ridge board;
- Hip rafter;
- Draught-proof strip;
- Reinforcing mesh;
- Skirting board;
- Prestressed concrete lintel;
- Thermal bridge.

8. Planning permission is required before a dwelling house can be erected.

(a) State **two** reasons why it is necessary to apply for planning permission to erect a dwelling house.

(b) Explain what is meant by full planning permission.

(c) Describe the purpose of any **three** of the following as they apply to an application for planning permission:

- Site notice;
- Site location map;
- Percolation test.
- Newspaper notice;
- Site layout map;

9. Thermal insulation is widely used in the construction of domestic dwellings.

(a) Discuss in detail **two** advantages of using thermal insulation in the construction of a dwelling house.

(b) List **two** materials used to provide thermal insulation.

(c) Using notes and ***neat freehand sketches,*** describe a suitable location in a dwelling house for **each** insulation material listed at **(b)**.

Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2006

Construction Studies

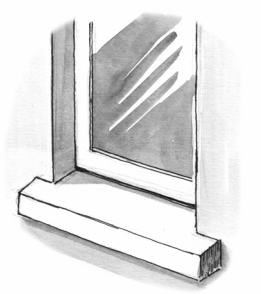
Theory - Ordinary Level

(200 Marks)

Wednesday 21 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 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.*

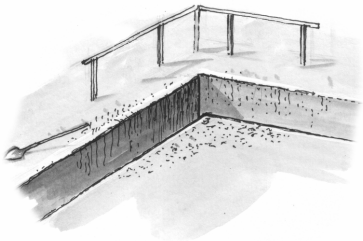
1. A double-glazed timber casement window, as shown in the sketch, is fixed in a 300mm external concrete block wall with insulated cavity. The wall is plastered on both sides.



(a) To a scale of 1:2 *(half full size),* draw a vertical section through the concrete cill and timber cill of the window. The size of the timber cill is 80 x 80 mm. Show all construction details from 300mm below to 200mm above the concrete cill.

(b) Indicate on your drawing ***one*** design detail that would prevent the cold-bridge effect at the window cill.

2. The sketch shows a trench for a strip foundation for an external wall of a dwelling house. The wall is a 300mm block wall and the foundation is 300mm thick throughout.

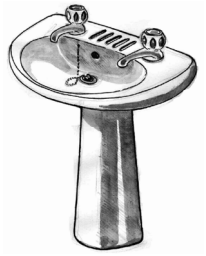


(a) Using notes and ***neat freehand sketches***, describe how to mark-out the foundation trench under the following headings:

- Profiles;
- Test for squareness;
- Width of trench.

(b) With the aid of notes and ***neat freehand sketches*** show how to determine the level of the top surface of the foundation prior to placing the concrete.

3. **(a)** Using a clear ***labelled diagram***, sketch a system to provide **cold water** to a wash hand basin, as shown in the sketch.

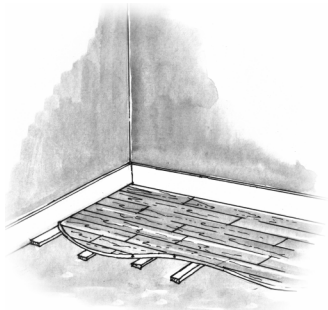


Include the following in your diagram:

- rising main;
- water storage tank and overflow;
- all pipework for cold water;
- necessary valves.

(b) Using notes and ***neat freehand sketches***, show **one** method that would prevent the freezing of water in the storage tank.

4. A tongued and grooved hardwood floor is fixed, on battens, to a concrete ground floor slab, as shown in the sketch. The external wall of the house is a 300mm concrete block wall with insulated cavity and the wall is plastered on both sides.



(a) To a scale of 1:5, draw a vertical section through the ground floor and the external wall. The section should show all the construction details from the bottom of the foundation to 300mm above the hardwood floor.

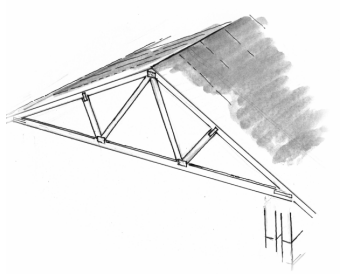
(b) Label and indicate the typical sizes of **four** main components.

5. **(a)** List and discuss **three** specific safety precautions to be observed when:

- Tiling a pitched roof;
- Using a router to shape the edge of a wooden panel;
- Placing a pre-stressed concrete lintel in position.

(b) List **three** items of personal protection equipment that should be worn on a construction site and discuss the importance of **each** item for personal safety.

6. The sketch shows an external wall and prefabricated trussed rafters for a domestic dwelling.



(a) Using notes and ***neat freehand sketches,*** show the position of the wallplate and indicate how it is to be secured to the external wall.

(b) It is proposed to cover the roof with concrete roof tiles. Using notes and ***neat freehand sketches*** show the sequence of operations necessary to tile the roof.

(c) List **two** advantages of prefabricated trussed rafters over a traditional cut roof.

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

- Mortise and tenon joint;
- Window board;
- Tread and riser of a stairs;
- Internal flush door;
- Architrave;
- Sleeper wall or dwarf wall;
- Double-glazing.

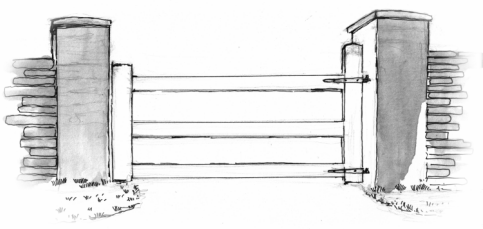
8. A system consisting of a septic tank and percolation area is frequently used for the treatment of sewage from a dwelling house in a rural setting.

(a) Using notes and ***neat freehand sketches,*** describe the system under the following headings:

- Design of the septic tank;
- Location of the septic tank;
- Function of the percolation area.

(b) List **one** advantage and **one** disadvantage of a septic tank and percolation area system.

9. The sketch shows a new wooden entrance gate to a dwelling house.



(a) Suggest a suitable wood for the gate and state **two** reasons for your choice of wood.

(b) Explain, ***using notes and freehand sketches***, the steps involved in preparing and painting the wooden gate.

(c) Using notes and ***neat freehand sketches,*** show a suitable design detail that would prevent the gate from sagging.

Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2007

Construction Studies

Theory - Ordinary Level

(200 Marks)

Wednesday 20 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.*

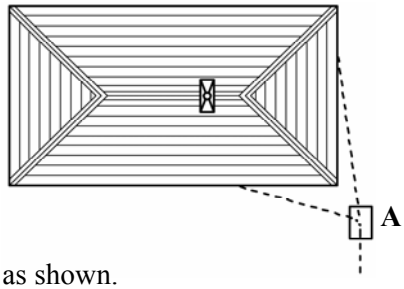
1. A kitchen has a solid concrete ground floor with a 20 mm quarry tile finish as shown. The external wall of the kitchen is a 300mm concrete block wall with an insulated cavity. The wall is plastered on both sides. The foundation is a traditional strip foundation.

(a) To a scale of 1:5, draw a vertical section through the external wall and ground floor. The section should show all the construction details from the bottom of the foundation to 300 mm above finished floor level.
***Note**: It is not necessary to show the kitchen cabinets on your drawing.*

(b) Recommend a suitable floor covering, other than tiles, for the kitchen floor and give **two** reasons for your choice.

2. **(a)** Using notes and ***neat freehand sketches,*** show **two** considerations that should be taken into account when laying sewer pipes for a domestic dwelling to ensure the safe removal of sewage from the dwelling.

(b) An inspection chamber is located at **A** in the sketch of the sewerage system for a dwelling house as shown. Using notes and a ***neat freehand sketch,*** show a vertical section through the inspection chamber.

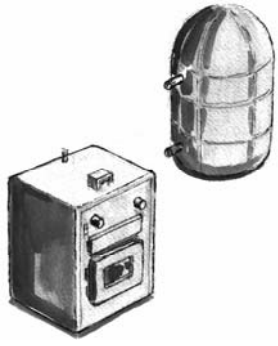


Your sketch should include the following:

- concrete foundation;
- side walls;
- position of the drain;
- benching to the drain;
- cover of inspection chamber.

(c) Outline **one** reason why the inspection chamber is located at **A** as shown.

3. The sketch shows an oil-fired boiler and an indirect cylinder for a hot water system in a dwelling house.



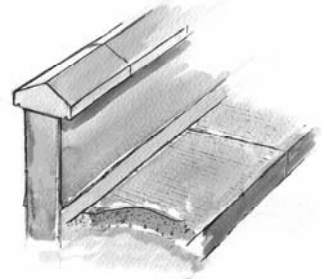
(a) Using a ***single-line labelled diagram,*** show the pipework required to connect the boiler, cylinder and expansion tank.

Your diagram should include the following:

- boiler and cylinder;
- expansion tank;
- rising main;
- pipework;
- insulation;
- valves.

(b) On the diagram, use arrows to indicate the direction of flow of the hot water between the boiler and the cylinder.

4. The sketch shows a garden wall 1.5 metres in height above the adjoining concrete footpath. The wall is a 225 mm solid concrete block wall and the footpath is 1.2 metres in width. The wall, which is plastered on both sides, has a precast concrete capping as shown.

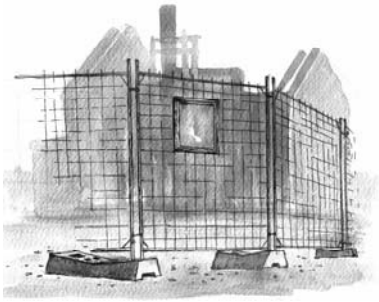


(a) To a scale of 1:10, draw a vertical section through the wall and footpath. The section should show the construction details from the bottom of the foundation of the wall to the top of the concrete capping.

(b) Using ***notes and neat freehand sketches,*** show how the wall is built **both** plumb and straight.

5. **(a)** List **two specific** safety precautions to be observed when using:

- an angle grinder to cut a mild steel reinforcing bar;
- a nail-gun to attach a timber batten to a concrete wall;
- an electrical extension lead on a construction site.



(b) Using ***neat freehand sketches,*** show the safety signs to indicate that the following personal protection equipment must be worn:

- a hard hat;
- safety goggles.

(c) Outline **two** additional safety precautions that a worker on a construction site should take to ensure personal safety.

6. **(a)** List **two** situations where ready-mixed concrete is usually used in the construction of a dwelling house and discuss **two** advantages of using ready-mixed concrete in preference to concrete mixed on site.

(b) Using notes and ***neat freehand sketches,*** show how a slump test is carried out on a batch of concrete.

(c) Using notes and ***neat freehand sketches,*** show the correct position of the reinforcing steel in a concrete lintel.

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

- housing joint;
- sapwood;
- dry lining;
- wall plate;
- compression fitting;
- wall tie;
- radon barrier.

8. Thermal insulation is important in the construction of a dwelling house.

(a) Using notes and ***neat freehand sketches,*** show the position of the thermal insulation quilt in the attic of a new house.

(b) On your sketch, show clearly the position of a vapour barrier and give **one** reason why it should be placed in the position outlined.

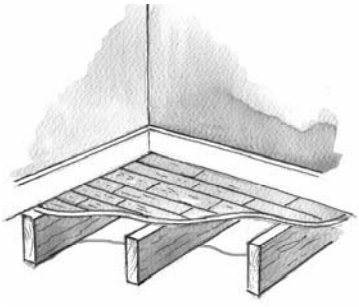
(c) Outline **two** safety precautions that should be observed when placing an insulation quilt in an attic.

9. The accompanying sketch shows the first floor of a dwelling house which consists of wooden joists, tongued and grooved flooring boards with a plasterboard ceiling beneath.

(a) Show by means of a ***neat freehand sketch,*** herringbone bridging for the floor structure.

(b) Discuss **two** advantages of using herringbone bridging instead of solid bridging.

(c) Using *a* ***large freehand sketch,*** show the tongued and grooved joint between two flooring boards and list **one** advantage of this method of jointing.



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2008

Construction Studies

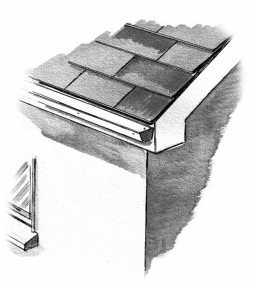
Theory - Ordinary Level

(200 marks)

Wednesday, 18 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. The sketch shows a tiled roof of a dwelling house, which is supported on a 300 mm external concrete block wall with an insulated cavity. The roof has a pitch of 30° and is a traditional cut roof.



(a) To a scale of 1:5, draw a vertical section through the eaves of the tiled roof and the external wall. Show all the construction details from 400 mm below the wall plate, through the eaves, and include **three** courses of tiles.

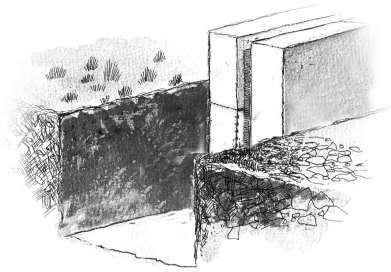
(b) On your drawing, show a method of providing ventilation to the roof members.

2. Strip foundations are widely used for modern dwelling houses.

(a) Using notes and ***neat freehand sketches,*** show the construction of a strip foundation for the external wall of a dwelling house.

Include the following in your sketch:

- depth of trench;
- width of foundation;
- thickness of foundation;
- position of a 300 mm wall on the foundation.



(b) On your sketch, show **one** design detail to ensure that the foundation is strong enough to support the external wall and the roof of the house. Include **two** typical dimensions.

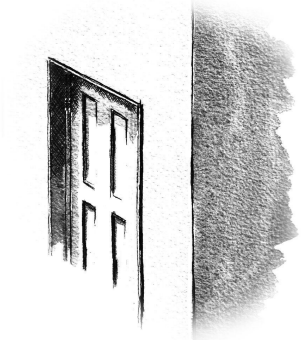
3. **(a)** Using a ***single-line labelled diagram,*** sketch a system to supply **cold** water to a wash hand basin and a water closet (WC) in a bathroom, as shown in the accompanying sketch.

Include the following in your diagram:

- water storage tank;
- rising main;
- pipework to wash hand basin and WC;
- typical sizes of pipework;
- all necessary valves.

(b) Using notes and ***neat freehand sketches***, show how the level of water is controlled in the cistern of the WC.

4. A four panel solid wooden door and doorframe are fixed in the external wall of a dwelling house, as shown in the accompanying sketch.
The doorframe is 120 mm x 75 mm and the top rail of the door is 120 mm x 50 mm. The wall is a 300 mm concrete block wall with an insulated cavity and is plastered on both sides.



(a) To a scale of 1:2 *(half full size)*, draw a vertical section through the external wall, doorframe and door. Show all the construction details from the 250 mm below to 350 mm above the concrete lintel at the door head.

(b) Include on your drawing a design detail to ensure that moisture does not penetrate to the inner leaf of the wall at the door head.

5. **(a)** State **two** reasons why it is necessary to apply for planning permission to erect a dwelling house.

(b) Explain what is meant by **outline planning permission** and describe one situation where a person might wish to apply for outline planning permission.

(c) Discuss in detail **two** reasons why a planning authority might refuse to grant planning permission for a dwelling house in the countryside.

6. Thermal insulation is used to reduce heat loss through the external walls of a dwelling house.

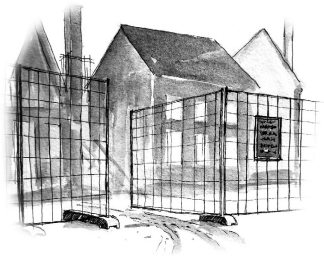
(a) Using notes and ***neat freehand sketches,*** show the location of a rigid insulation board in the cavity of an external wall of concrete block construction.
Show the typical thickness of the insulation board.

(b) Using notes and ***neat freehand sketches*** show how the insulation board is held in place in the cavity.

(c) Using notes and ***neat freehand sketches*** show another method of insulating the external wall of the house.

7. **(a)** List **two specific** safety precautions to be observed in **each** of the following situations:

- using a pillar drill in the Construction Studies room;
- fitting a double-glazed unit in a wooden window frame;
- using a contact adhesive to fix veneer to a wooden panel.



(b) Sketch **two** safety signs that should be displayed at the entrance to a construction site, as shown in the accompanying sketch, and explain the purpose of each safety sign.

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

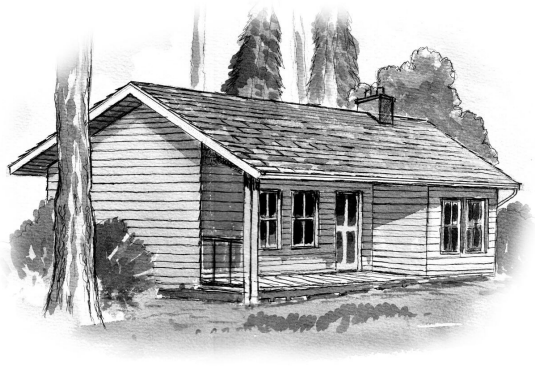
- dovetail joint;
- through and through sawing;
- damp proof membrane;
- pre-stressed concrete lintel;
- plasterboard;
- gully trap;
- inspection chamber.

9. The accompanying sketch shows a chalet with an external wooden cladding.

(a) Choose a suitable wood for the external cladding and give **two** reasons for your choice.

(b) Recommend a suitable applied finish to help preserve the cladding and, using notes and ***neat freehand sketches,*** describe the steps involved in applying the finish.

(c) The chalet shown is designed to help protect the cladding from the weather. Using notes and ***neat freehand sketches,*** show **one** design feature that helps protect the cladding from the effects of the weather.



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2009

Construction Studies

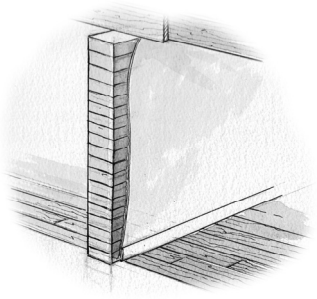
Theory - Ordinary Level

(200 marks)

Wednesday, 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. The sketch shows an internal load bearing wall built of solid concrete blocks. The wall is 225 mm thick and is plastered on both sides. The ground floor is an insulated solid concrete floor. The floor is finished with 25 mm thick hardwood flooring fixed to battens.

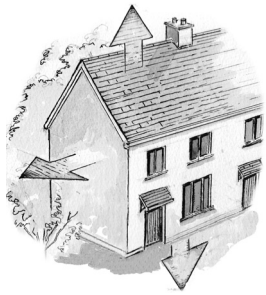


(a) To a scale of 1:5, draw a vertical section through the foundation, the 225 mm wall and the ground floor. Show all the construction details from the bottom of the foundation to 500 mm above finished floor level. Include **four** typical dimensions on your drawing.

(b) Indicate on your drawing the insulation to the floor slab and show clearly the position of the radon barrier.

Note: Show a floor width of 500 mm at either side of the internal wall.

2. The arrows show three areas through which heat is lost in a poorly insulated dwelling house. The house has a slated roof, concrete block external walls with a cavity and a solid concrete ground floor.

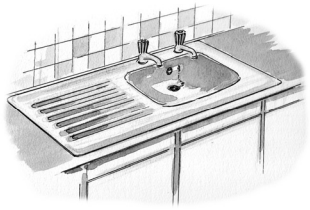


(a) Select any **two** areas of the dwelling house and, using notes and ***neat freehand sketches***, describe how you would insulate the areas selected to reduce the heat loss. Indicate on your sketches the type of insulation and give the typical thickness of the insulation.

(b) Discuss **two** advantages of increasing the thermal insulation levels in a dwelling house.

3. **(a)** Using a ***single-line labelled diagram***, sketch a system to supply hot **and** cold water to a kitchen sink, as shown in the accompanying sketch.

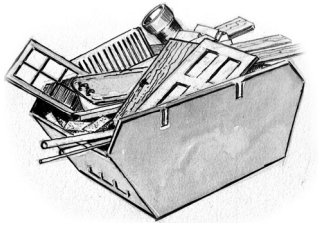
Include the following in your diagram:



- rising main
- water storage tank
- hot water cylinder
- pipework to hot and cold taps
- all necessary valves
- typical sizes of pipework.

(b) Using notes and ***neat freehand sketches***, show one method of ensuring that the water in the cylinder stays hot for as long as possible.

4. The careless disposal of waste in the construction industry can have a harmful impact on the environment. The accompanying sketch shows a mixed range of building materials from a construction site placed in a skip for disposal to a landfill site.

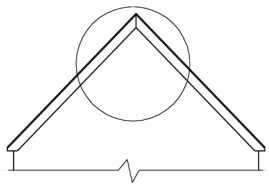


(a) Outline **two** environmental hazards associated with the disposal of this waste to a landfill site.

(b) Using notes and ***neat freehand sketches***, suggest **two** methods of managing the disposal of the waste in a more environmentally friendly manner.

(c) Give **one** example where wood can be reused on a construction site and outline how this helps reduce waste on the site.

5. A dwelling house has a traditional cut roof with a pitch of 45 degrees, as shown in the sketch. The roof, which is insulated, is covered with concrete roof tiles which are supported on 200 mm × 50 mm rafters.



To a scale of 1:5, draw a vertical section through the portion of the roof at the ridge, as shown within the circle in the sketch. Show all the construction details from the top of the ridge to 150 mm below the collar tie and include three courses of tiles at the ridge. Label the roof components and give their typical sizes.

6. **(a)** List **two** safety precautions to be observed in each of the following situations and give **one** reason for **each** safety precaution listed:

- placing ready-mix concrete in a foundation trench
- cutting a pre-stressed concrete lintel.

(b) Workers can be in danger when slating a pitched roof. Using notes and ***neat freehand sketches,*** describe **two** safety precautions that should be observed when slating such a roof.

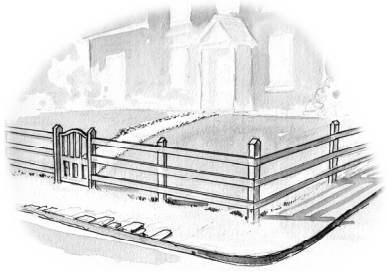
7. **(a)** Describe, using notes and ***neat freehand sketches,*** how rainwater is collected and discharged to ground level from a pitched roof of a dwelling house, as shown in the accompanying sketch. Label the components and give their typical sizes.

(b) In order to conserve water, it is recommended that rainwater be stored for use. Suggest **two** suitable uses for the stored rainwater.

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

- cross halving joint
- heartwood
- thermal/cold bridge
- double glazing
- soil pipe
- architrave
- radon barrier.

9. Wooden fencing and the entrance gate to the front garden of a house are shown in the accompanying sketch.



(a) Outline **two** environmental reasons why wood is the preferred material for the fencing and gate.

(b) Choose a suitable homegrown wood for the fencing and give **two** reasons for your choice.

(c) Recommend a suitable applied finish to help preserve the wooden fencing from the weather. Using notes and ***neat freehand sketches,*** describe the steps involved in applying the finish to the fencing.

Coimisiún na Scrúduithe Stáit
State Examinations Commission

2010. M75

Leaving Certificate Examination, 2010

Construction Studies

Theory - Ordinary Level

(200 marks)

Wednesday, 23 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.*

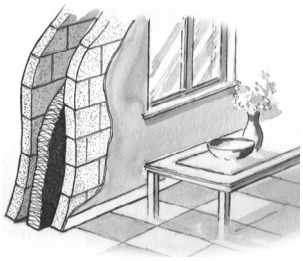
(d) *Drawings and sketches to be made in pencil.*

(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.*

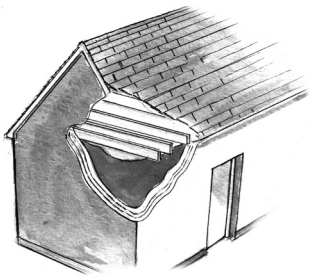
1. A living room has a solid concrete ground floor with a 20 mm quarry tile finish as shown. The external wall of the living room is a 350 mm concrete block wall with an insulated cavity. The wall is plastered on both sides. The foundation is a traditional strip foundation.



(a) To a scale of 1:5, draw a vertical section through the external wall and ground floor. The section should show all the construction details from the bottom of the foundation to 400 mm above finished floor level. Indicate the typical sizes of **four** main components.

(b) Show on your drawing the typical design detailing to prevent a thermal/cold bridge at the junction of the concrete floor and the external wall.

2. The owner of a house built in the 1960s intends to improve the thermal insulation levels by insulating the external walls and the attic space. The external wall is a 300 mm concrete block wall with an uninsulated cavity. The attic space is also uninsulated. It is proposed to inject insulation into the cavity of the external walls.

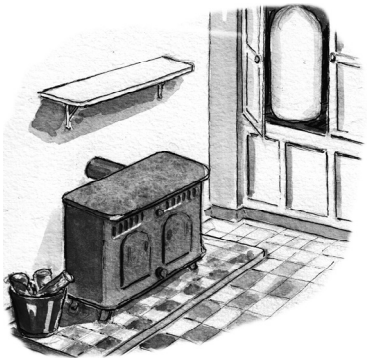


(a) Using notes and ***neat freehand sketches***, describe the procedures to be followed when injecting the insulation into the cavity. Specify the type of insulation to be used.

(b) Discuss **one** advantage and **one** disadvantage of this method of cavity insulation.

(c) Using notes and ***neat freehand sketches,*** show how the attic is to be insulated and include the insulation to the water storage tank. Specify the insulation material for the attic and give its typical thickness.

3. A wood burning stove, as shown in the accompanying sketch, has a back boiler fitted. The back boiler is connected to an indirect cylinder to supply hot water for a dwelling house.



(a) Using a ***single-line labelled diagram,*** show the pipework required to connect the back boiler, cylinder and expansion tank.

Include the following in your diagram:

- back boiler and indirect cylinder
- expansion tank and overflow
- rising main
- pipework and insulation
- valves.

(b) Discuss **two** advantages of using a wood burning stove to heat domestic hot water.

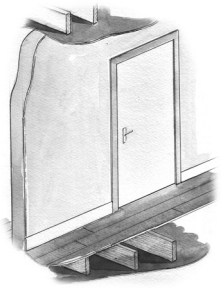
4. A solid pine door and doorframe are shown in the accompanying sketch. The door and frame are fitted in a 100 mm internal concrete block wall which is plastered on both sides.

(a) Show, using notes and ***neat freehand sketches,*** how to ensure that the doorframe is assembled square prior to fitting the door.

(b) Show, using notes and ***neat freehand sketches,*** how the doorframe is fitted in the block wall.

(c) Sketch a suitable hinge for this door and show, using notes and ***neat freehand sketches,*** the steps involved in fitting one hinge to the door.

5. A non-load bearing timber stud partition separates two bedrooms on the first floor of a two storey dwelling house, as shown in the accompanying sketch. The first floor joists are 225 mm × 50 mm, the floor is a tongued and grooved floor and there is a plasterboard ceiling beneath. A flush panel door is fitted in the partition.



(a) To a scale of 1:5, draw a vertical section through the floor and stud partition. Show all the construction details from the bottom of the plasterboard ceiling, through the floor joists, the door and saddle to a point 1.5 metres above finished floor level. Label the components and give their typical sizes.

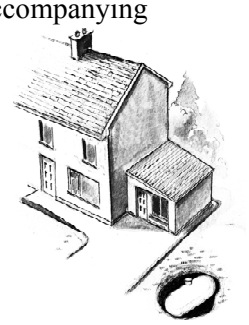
(b) Show on your drawing **one** method that will help reduce the transmittance of sound through the stud partition.

6. **(a)** List **two** specific safety precautions to be observed in **each** of the following situations and give **one** reason for each safety precaution listed:

- using a ladder when painting an external wall
- using a veneering knife to cut veneers
- using a jig saw to cut a wooden panel.

(b) Using notes and ***neat freehand sketches,*** describe **two** specific safety precautions that should be observed when using electrical tools out-of-doors.

7. An extension to the side of a dwelling house has a lean-to roof, as shown in the accompanying sketch. Also shown is an underground rainwater storage tank.



(a) Using notes and ***neat freehand sketches,*** show how the rainwater is collected from the lean-to roof and discharged to a gulley trap at ground level. Label the components and give their typical sizes.

(b) The rainwater is conveyed to the underground water storage tank for re-use. Using notes and ***neat freehand sketches,*** show the pipework necessary to convey the rainwater from the gulley trap to the storage tank and show the location of a rainwater filter in this system.

(c) Discuss **two** advantages of storing rainwater and give **two** suitable uses for the stored rainwater.

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

- concrete lintel
- door saddle
- triple glazing
- mortice and tenon
- quarter sawing
- window cill
- energy rating
- ridge board
- vapour barrier.

9. A terrace of traditional houses is shown in the accompanying sketch. The houses have slated roofs and wooden windows and doors. The windows are in need of repair.

(a) Discuss **two** reasons why it is advisable to repair the existing wooden windows in these houses rather than replace them with new windows.

(b) Describe, ***using notes and neat freehand sketches,*** the steps to be followed when replacing a broken pane of glass in one of the windows.

(c) Describe, ***using notes and neat freehand sketches,*** the steps to be followed when removing the existing paint, preparing the surface and repainting a window frame in one of the houses.