



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.



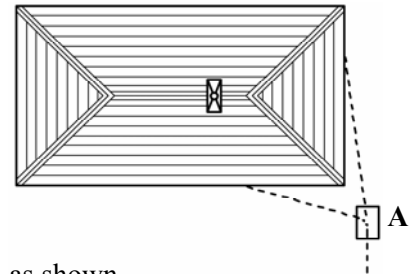
- (a) To a scale of 1:5, draw a vertical section through the external wall and ground floor. The section should show all the construction details from the bottom of the foundation to 300 mm above finished floor level.
Note: It is not necessary to show the kitchen cabinets on your drawing.
- (b) Recommend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



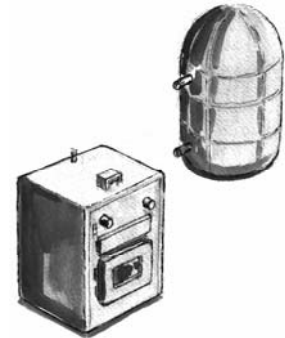
- (c) Outline **one** reason why the inspection chamber is located at A as shown.

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.

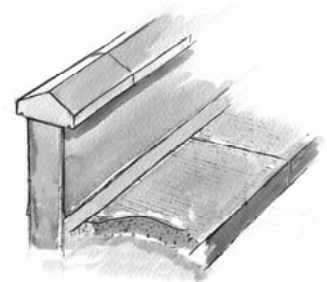
Your diagram should include the following:

- 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.



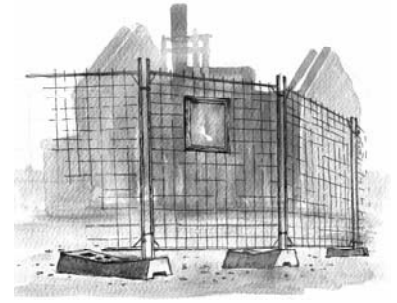
- (a) To a scale of 1:10, draw a vertical section through the wall and footpath. The section should show the construction details from the bottom of the foundation of the wall to the top of the concrete capping.
- (b) Using *notes and neat freehand sketches*, show how the wall is built **both** plumb 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.

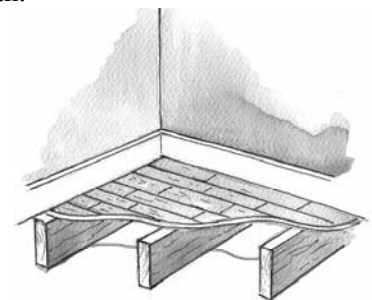
- (c) Outline **two** safety precautions that should be observed when placing an insulation quilt in an attic.

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.



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