

1934

## Building Construction (1st Year): Technical School Examinations 1934

Department of Education: Technical Instruction Branch

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# COURSE IN BUILDING.

(30)

## AN ROINN OIDEACHAIS.

(Department of Education.)

## BRAINSE AN CHEARD-OIDEACHAIS.

(Technical Instruction Branch.)

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### TECHNICAL SCHOOL EXAMINATIONS.

1934.

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#### BUILDING CONSTRUCTION.

(First Year.)

*Friday, May 11th—7 to 10 p.m.*

*Examiner—W. DAVIDSON, ESQ.*

*Co-Examiner—F. W. SINCLAIR, ESQ.*

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#### GENERAL INSTRUCTIONS.

You are carefully to enter on the Answer Book and Envelope supplied your Examination Number and the subject of examination, but you are not to write your name on either. No credit will be given for any Answer Book upon which your name is written, or upon which your Examination Number is not written.

You must not have with you any book, notes, or scribbling paper.

You are not allowed to write or make any marks upon your paper of questions.

You must not, under any circumstances whatever, speak to or communicate with another candidate; and no explanation of the subject of the examination may be asked for or given.

You must remain seated until your answer-book has been taken up, and then leave the examination-room quietly. You will not be permitted to leave before the expiration of twenty minutes from the commencement of the examination, and will not be re-admitted after having once left the room.

If you break any of these rules, or use any unfair means, you are liable to be dismissed from the examination, and your examination may be cancelled by the Department.

*Three hours are allowed for this paper. Answer-books, unless previously given up, will be collected at 10 p.m.*

## INSTRUCTIONS.

Read the General Instructions on page 1.

- (a) Not more than six questions are to be attempted.
- (b) Answers must be written in ink; diagrams may be in pencil.
- (c) Small diagrams and sketches, to illustrate written descriptions, should be made upon squared paper.
- (d) Write the number of the question before the answer.
- (e) Equal values are assigned to the questions.

1. The external wall of a building in English bond is two bricks in thickness and the height above the ground level to the under side of the tassel or wall plate on which the timber joists rest is 9 inches. Make a vertical section through the wall to a scale of one inch to one foot showing the concrete foundation, brick footings and wall, to a height of about two courses above the level of the floor. Indicate the ground level, damp-proof course and ground layer, which is 6 inches thick. The joists are  $5\frac{1}{2}$  inches deep.

- 2. (a) Mention three suitable materials for horizontal damp-proof courses in walls. Place them in order of preference.
- (b) Give the proper proportions of aggregate, sand, and Portland cement, for use in the foundations and in the ground layers of dwelling houses. What is the maximum size of aggregate suitable in each case?
- (c) What is the object of a ground layer?

3. Draw to a scale of an inch to a foot the plans of two consecutive courses of brickwork in English bond at the angle of a building with walls two bricks in thickness. Working from the quoin which is on the left, show five stretchers in length on the front wall and about three stretchers on the return wall, which is at right angles to the front. Regard the right hand side as having a plain stopped end. Make an elevation of the front wall showing about five courses in height.

4. Draw to a scale of  $1\frac{1}{2}$  inches to a foot a cross-section through a stone window sill 11 inches  $\times$  6 inches in a wall  $1\frac{1}{2}$  bricks thick; the reveal being  $4\frac{1}{2}$  inches. The sill is to be properly weathered, throated and grooved for metal water bar. Make a front elevation of one end of the sill in its position in relation to the ope.

5. What is a bond stone in masonry? Name some Irish quarries from which we obtain the following classes of building stones; (a) limestone, (b) sandstone, (c) granite. Mention the chief constituent of each of these stones.

6. Sketch approximately to scale of  $\frac{1}{2}$  inch. to a foot, about 6 feet in length of a random rubble wall built in courses and set in mortar. The wall is 4 feet high from the ground to the top of a 5 inch feather-edged coping.

Make a vertical section through the wall, which is 18 inches thick, showing the bonding and the foundation stones below the ground level.

7. Make an elevation to a scale of  $\frac{1}{2}$  inch to a foot of a stud partition suitable for dividing a ground floor apartment, the walls of which are 12 feet apart, the floor being of concrete. The height from floor to ceiling is 10 feet. Provide a doorway at the centre, 6ft. 9ins.  $\times$  3 ft. The studding on one side and over the door only, need be shown. The partition is intended for ordinary wood laths and plaster. Dimension the scantlings.

8. Make an elevation of a four panel door to a scale of  $\frac{3}{4}$  inch to one foot. The door is to measure 6ft. 9ins.  $\times$  2ft. 9ins.  $\times$  2ins. It is to be finished with flat panels and planted mouldings.

Give details of the mortice and tenon joints used at the following points, (a) between style and top rail, (b) between style and lockrail, (c) between style and bottom rail. Show in figures the thickness of the tenon used. Scale 3 inches to a foot.

9. Give a detail horizontal section to a scale of 3 inches to a foot through one jamb of an internal doorway, fitted with a set of plain or a set of skeleton jamb linings. The door is 2 inches thick and the linings are to be twice rebated. The wall is 9 inches thick and plastered both sides. Show the grounds, 4ins.  $\times$   $1\frac{1}{4}$ ins. moulded architraves and indicate the method of securing the linings to the wall.

10. A casement or solid framed window, opening outwards on hinges, measures about 3ft. 9ins.  $\times$  2ft. externally. The frame material is  $4\frac{1}{2}$ ins.  $\times$  3ins. and the sashes are  $1\frac{3}{4}$  inches thick. Make a broken vertical section through the heads and sills of the frame and sash and a broken horizontal section through the hanging and closing sides of the window. Scale 3 inches to a foot.

11. An upper floor room, measures 16ft.  $\times$  14ft. The fireplace is at the centre of one of the 14 foot walls. The chimney breast which is 6 feet wide, has a projection of 14 inches and the joists run the short way of the room. Draw the outline plan of this floor to a scale of  $\frac{1}{4}$  inch to a foot, showing the necessary joisting and trimming around the hearth. Write the dimensions on the joists. The flooring need not be shown.

12. Explain by neat sketches the meaning of the following terms:—(a) herring-bone bridging, (b) tongued and grooved and V jointed boarding, (c) tusk-tenon joint, (d) stop chamfered edge, (e) beaded edge, (f) double reed.

13. Draw to a scale of  $1\frac{1}{2}$  inches to one foot a vertical cross-section through a tapering gutter at the back of a parapet wall. The roof slopes at an angle of  $30^\circ$  and is covered with Countess slates, (20ins.  $\times$  10ins.), centre nailed on solid boarding. The bottom of the gutter is 9 inches broad where the section is taken.

Show the leadwork clearly, also the slating on the roof for a distance of about two margins. The roof timbers need not be shown, single lines will do to indicate the slope of roof, bottom of gutter and upright wall. What should be the weight per square foot of the lead used in the gutter?

14.(a) State the difference between rich lime, poor lime and hydraulic lime. (b) Which of these do you consider best for internal plastering, and why? (c) Describe the preparation and use of fibrous plaster slabs. (d) What is gauged stuff? (e) What is a screed?