



1934

# Telephony: Technical School Examinations 1934

Department of Education: Technical Instruction Branch

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AN ROINN OIDEACHAIS  
(Department of Education),

BRAINSE AN CHEARD-OIDEACHAIS  
(Technical Instruction Branch).

SPECIAL EXAMINATIONS FOR POST OFFICE  
EMPLOYEES.

1934.

TELEPHONY.

*Friday, May 11th—7 to 10 p.m.*

*Examiner*—J. D. FERGUSON, ESQ., B.S.C. (Eng.), A.M.I.E.E.,  
M.A.I.E.E., M.I.R.E.

*Co-Examiner*—J. P. HACKETT, ESQ., B.E., A.R.C.SCI.

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) EIGHT questions only may be attempted. When feasible, answers must be illustrated by simple sketches.

(b) Equal values are attached to the questions.

(c) Answers must be written in INK; diagrams may be drawn in PENCIL.

(d) Write the number of the question distinctly, in the margin of the paper, before the answer.

(1) What does the term *impedance* convey to you? How does it differ from *resistance*? Which has the greater impedance to telephone currents: a 2 m.f. condenser or a retardation coil, and why?

(2) Describe the construction of a slow discharge type of secondary cell suitable for use at a small C.B. private branch exchange. What advantages has this type of cell over the ordinary standard type of secondary cell for such work?

(3) Describe in detail the construction of any type of switchboard cord with which you are familiar. Why is a simple continuity test with a battery and galvanometer insufficient in the case of telephone cords, and how should such cords be tested to ascertain if they are fit for use in a telephone circuit?

(4) Supposing you are sent on a maintenance visit to a small, 10 subscriber, C.B. exchange explain fully the tests you would carry out, and the enquiries you would make before leaving the exchange.

(5) In what units are transmission losses measured? Mention the various parts of a telephone circuit in which serious transmission losses may occur. In what part of the circuit is the transmission loss usually greatest?

(6) Draw diagrams of the cord circuit and line connections on a 50 line magneto switchboard.

(7) Why is paper-core lead-covered cable used for telephone distribution work? Describe the construction of such a cable.

(8) Describe, step by step, what happens from the time a subscriber lifts off his handset (or receiver) until he "hangs up" again after making a call to another subscriber in the same C.B. exchange area.

(9) Sketch the construction of a magneto bell and explain carefully how it works.

(10) Sketch the construction of a protector suitable for use at a subscriber's station and explain fully the object of each part of the fitting.

(11) A battery gives a voltmeter reading of 25 volts on open circuit. If the internal resistance of the battery is known to be 10 ohms, and the voltmeter reading drops to 20 volts when the circuit is completed, calculate the external resistance of the circuit.

(12) The insulation resistance of a long telephone line between the points A and B measures 80,000 ohms. When the line is extended to C the insulation resistance is then found to be 60,000 ohms. Calculate the insulation resistance of the section of the line between B and C.