

1934

## Telegraphy: 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.

TELEGRAPHY.

*Wednesday, May 9th—7 to 10 p.m.*

*Examiner*—J. D. FERGUSON, ESQ., B.SC. (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.S.C.I.

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. Where 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 arrangement of 90 cells, each having an internal resistance of 2 ohms, will send the maximum current through an external resistance of 20 ohms? If the E.M.F. of each cell is 1.5 volts, calculate the value of the maximum current.

(2) Where it is necessary, on grounds of economy, to run telegraph wires on an existing, open wire, telephone trunk route, certain precautions should be taken in order to minimise the harmful effects of telegraphic induction upon the telephone circuits. Mention these precautions, and explain exactly how they reduce inductive effects.

(3) Describe the Detector No. 2 and explain its various uses.

(4) What advantages have secondary cells over primary cells for telegraph purposes? Why are secondary batteries always provided with fuses, whilst fuses are not generally employed with primary batteries?

(5) Describe how you would test a double current key, if you had any doubt about its condition, before joining it up in a duplex circuit.

(6) What is meant by the *multiplying power* of a shunt? A moving coil instrument has an unshunted resistance of 90 ohms, and reads a maximum current of 10 milliamperes. What resistance must be shunted across it in order to make it read a maximum current of 100 milliamperes?

(7) Explain the significance of the terms *up station* and *down station*. Draw the complete wiring diagram of a down station, double current duplex set.

(8) What is meant by *universal working*? Is it necessary to distinguish between up and down stations in universal working? Give reasons for your answer. Sketch the connections of a universal D.C. set.

(9) Describe the methods that may be adopted to overcome trouble in a telegraph circuit caused by earth currents. What are the known sources of earth currents?

(10) Describe fully the preservative process to which wood poles are subjected before they are erected. How would you test a pole that had been in situ for a number of years to ascertain if it required renewal?

(11) Telegraph wire is gauged in lbs. per mile. What is the advantage of this method of gauging? Taking the ohm-mile-constant of iron as 5,328, calculate the resistance of 30 miles of 400 lbs. iron wire.

(12) Give a complete description of P.B.J. insulated wire. Would you use this wire to protect telegraph lines against accidental contact with 10,000 volt power lines? Give reasons for your answer.