



1933

Electrical Engineering (1st Year): Technical School Examinations 1933

Department of Education: Technical Instruction Branch

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COURSE IN ELECTRICAL ENGINEERING.

(49.)

AN ROINN OIDEACHAIS.
(Department of Education.)

BRAINSE AN CHEÁRD-OIDEACHAIS.
(Technical Instruction Branch.)

TECHNICAL SCHOOL EXAMINATIONS.
1933.

ELECTRICAL ENGINEERING.
(First Year.)

Tuesday, May 23rd—7 p.m. to 9 p.m.

Examiner—PROFESSOR W. BROWN, B.S.C., M.I.E.E.

Co-Examiner—J. P. HACKETT, ESQ., B.E., A.R.C.S.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 beginning 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.

Two hours are allowed for this paper. Answer books, unless previously given up, will be collected at 9 p.m.

INSTRUCTIONS.

Read the General Instructions on page 1.

- (a) Not more than *six* questions may be attempted.
- (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 your paper before the answer.

1. What is meant by saying that a body is positively charged or negatively charged? Explain how you would find out the kind of charge. You have some pieces of paper clippings on a table and you bring near to them a stick of sealing wax which you have rubbed with flannel. State and explain what happens.

2. You are given two pieces of metal of the same size and shape, one of which is magnetic. Describe two different methods by means of which you would find out the magnetic piece. Give reasons. Explain what you mean by lines of magnetic force.

3. When you make a piece of steel into a magnet by means of a solenoid, why must the coil be longer than the steel rod? If you were to magnetise a soft iron ring by means of a solenoid, would the ring show any poles? Explain.

4. A *constant* potential difference is maintained between two points A and B. When these points are joined by a coil of wire one ampere flows between them. What change would you make so that 5 amperes would flow between A and B? Give reasons.

5. You are to find the resistance of a short, thick, piece of wire, and are given a coil of known resistance, a storage cell, a suitable high resistance galvanometer and connecting wires for the experiment. Explain, with the help of a clear diagram, how you would measure the resistance of the short wire.

6. Ten glow lamps, each taking 100 volts and 0.2 ampere are connected so as to form a group of five rows in parallel. Find the value of a resistance which must be put in series with the group of lamps in order that they may be used on a 250 volt circuit.

7. What is the Board of Trade Unit? Find the number of B. O. T. units which are developed during a 12 hours shift by three direct current dynamos each giving 550 volts and 1,200 amperes.

8. What is meant by voltage drop in cables? Eighty K.W. at a pressure of 500 volts are required at a place 5 miles from the power station. The cable has a resistance of 0.08 ohm. per mile, find the voltage at the station end of the cable. Why would you not use a cable of less resistance—say 0.008 ohm. per mile?

9. For the purpose of illumination, state briefly the differences between an electric glow lamp and an arc lamp. Why are glow lamps gradually replacing arc lamps for street lighting?

10. The electric bell in your home ceases to act. State the probable reasons for this, and describe clearly how you would find out and remedy the defect or defects.