

AN ROINN OIDEACHAIS.
(DEPARTMENT OF EDUCATION.)

AN BRAINSE GAIRM-OIDEACHAIS.
(TECHNICAL INSTRUCTION BRANCH.)

CERTIFICATE EXAMINATIONS
for
DAY VOCATIONAL COURSES, 1949.

MAGNETISM AND ELECTRICITY.

Thursday, June 23rd—10 to 11.30 a.m.

INSTRUCTIONS.

Not more than 5 questions to be attempted.

1. What do you understand by the terms *magnetic field* and *line of magnetic force*?

Describe, with the aid of sketches, two different experimental methods of determining the form of the lines of force in the neighbourhood of a bar magnet.

[14 marks.]

2. Define *specific resistance*.

A wire 1 yard long and 0.02 inch in diameter has a resistance of 3.5 ohms. Find the specific resistance of the material of which it is made.

[14 marks.]

3. What is meant by *polarisation* in a simple cell and what ill-effects does it produce?

Sketch, and name the essential parts of, any one form of practical primary cell. What acts as depolariser?

[16 marks.]

[P.T.O.]

4. Explain the *loss of voltage* inside a cell which is delivering current.

When a cell of E.M.F. 1.1 volts supplies current to a resistor of 4 ohms the potential difference between the cell terminals is 0.8 volt. Calculate (a) the current flowing; (b) the internal resistance of the cell.

[16 marks.]

5. Sketch and describe the working of any form of ammeter with which you are familiar.

How does an ammeter and a voltmeter of the same type differ in their internal connections?

[18 marks.]

6. The valve filaments of a radio set develop 1.6 watts when worked off a 2 volt, 60 ampere-hour, accumulator. Calculate (a) the current taken from the accumulator; (b) the number of hours the accumulator may be used before recharging.

If the price of charging the accumulator is 1/- what is the cost per kilowatt-hour of the energy used by the valve filaments?

[18 marks.]

7. Explain the terms *electrolyte, anode, cathode, coulomb*.

Given that one coulomb of electricity deposits 0.00329 grams of copper calculate the steady current which on passing through a solution of a copper salt deposits 1.33 grams of copper in 45 minutes.

[24 marks.]

8. Explain briefly the modern concept of a flow of electric current.

Describe, with the aid of a sketch, how a two-electrode valve acts as a rectifier.

[24 marks.]