AN ROINN OIDEACHAIS.

(DEPARTMENT OF EDUCATION.)

AN BHRAINSE GHAIRM-OIDEACHAIS.

(TECHNICAL INSTRUCTION BRANCH.)

CERTIFICATE EXAMINATIONS

for

DAY VOCATIONAL COURSES, 1948.

MAGNETISM AND ELECTRICITY.

Thursday, June 24th—10 *to* 11.30 *a.m.*

INSTRUCTIONS.

Not more than 5 questions to be attempted.

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1. Describe how you would magnetise a piece of clock-spring using a bar magnet. Indicate the polarity you would expect to get and explain how you would use a compass needle to test your deduction. How could the clock-spring be completely demagnetised?

[14 marks.]

2. What conditions are necessary to get a flow of electric current? Explain the term *electro-motive force* and name the unit in which it is measured. Distinguish between *conductors* and *insulators* and give two examples of each.

[14 marks.]

3. Distinguish between resistors joined in series and in parallel.

When two resistors of 4 ohms and 6 ohms respectively are joined in parallel and connected to a supply of electric pressure a current of 5 amperes is drawn from the supply. Calculate (*a*) the combined resistance; (*b*) the supply voltage; (*c*) the current through each resistor.

[16 marks.]

[P.T.O.

4. Name the effects that can be produced by a flow of electric current and indicate briefly how an electro-magnet, an electric lamp and a lead-acid cell illustrate these effects.

[16 marks.]

5. Name and define the electrical units of *power, energy* and *quantity*.

A resistor of 50 ohms is connected to 230 volt mains. Calculate (*a*) the power developed; (*b*) the energy consumed in 2 hours; (*c*) the quantity of electricity passing per minute.

[18 marks.]

6. Describe, with the aid of a neat sketch, the Metre Bridge method of measuring the resistance of a length of given wire.

How would you determine the specific resistance of the material of which the wire is made?

[18 marks.]

7. Explain why the terminal voltage of a cell drops when the current taken from it increases.

A battery of cells supplies a current of 1 ampere when connected to a resistor of 6 ohms and supplies a current of 0·5 ampere when connected to a resistor of 18 ohms. Calculate the E.M.F. and the internal resistance of the battery.

[24 marks.]

8. Sketch, and name the parts of, any form of condenser with which you are familiar. What factors influence the capacity of a condenser?

Determine the capacity of a condenser if a charge of 0·05 coulomb causes a p.d. of 2,000 volts between the plates.

[24 marks.]