AN ROINN OIDEACHAIS

BRAINSE AN GHAIRMOIDEACHAIS

CERTIFICATE EXAMINATIONS

FOR

DAY VOCATIONAL COURSES, 1967

MAGNETISM AND ELECTRICITY

TUESDAY, 13th JUNE - 10 a.m. to 12 noon

INSTRUCTIONS

Not more than five questions to be attempted.
All the questions carry equal marks.
Illustrate your answers with sketches and diagrams where possible.

1. (a) Show, with diagram, how a steel bar can be magnetised by an electrical method.
   (b) Draw on the diagram provided the Magnetic Field around the bar magnet in Fig. 1.

2. State Lenz's Law.
   In Fig. 2, X and Y are two coils wound on a soft iron core. Describe clearly what happens when switch S is (a) closed (b) opened and show the direction of current flow through the galvanometer G in each case by marking "X" in the correct space in the table below Fig. 2.
   Name an electrical device in common use which operates on the same principle and state the purpose for which it is used.

3. Describe with diagram an elementary type of D.C. Motor and show how it works, stating any principle on which its action depends.

4. Describe the electrolysis of water.
   It is required to coat a tin plate with 3·456 grams of copper using a current of 2 amps. Find the time required if the E.C.E. of copper is 0·00032 grams/coulomb.

5. Describe with diagram the Leclanche Cell and say how it works. Show clearly how it overcomes the disadvantages of the Simple Cell.

6. What is meant by (a) E.M.F. (b) P.D. of a cell ?
   A cell of E.M.F. 2 Volts and internal resistance 0·1 ohms. is connected to an external resistance. The P.D. then falls to 1·6 Volts.

   Find (a) the current flowing,
   (b) the value of the external resistance in ohms,
   (c) the energy consumed, in joules, in the external resistance if the current flows for 10 minutes.

7. State Ohm's Law. Say briefly how you would show that it is true.
   A circuit is connected as in Fig. 3.

   Calculate (a) the total resistance,
   (b) the voltage drop over the 4 ohm resistance
   (c) the current through the 3 ohm resistance.

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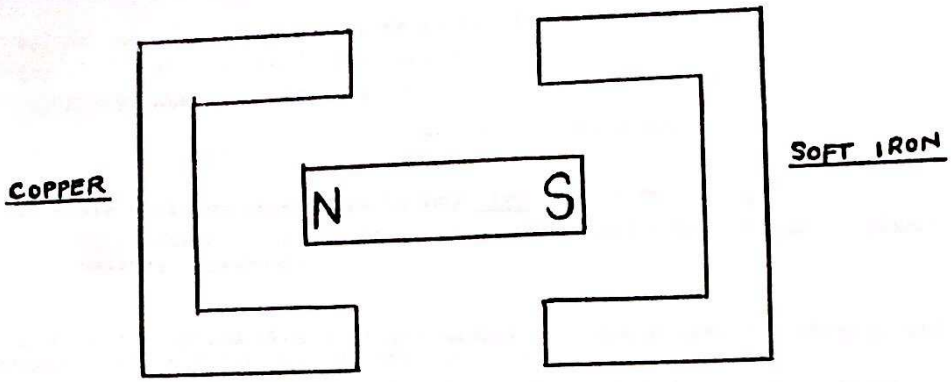

FIG. I

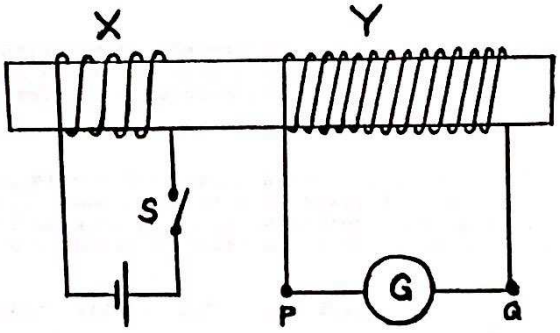

FIG. 2

Switch "S" closes
Switch "S" opens

Current through G flows	
P to Q	Q to P

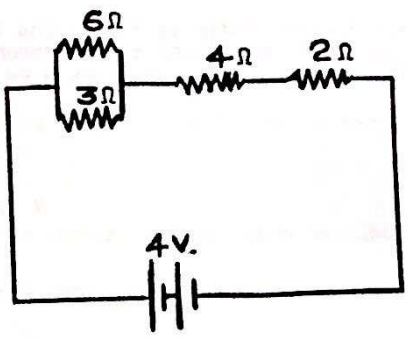

FIG. 3