BRAINSE AN GHAIRMOIDEACHAIS

CERTIFICATE EXAMINATIONS

for

DAY VOCATIONAL COURSES, 1964.

MAGNETISM AND ELECTRICITY

MONDAY, 15th 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) Draw the magnetic field surrounding the magnet and piece of soft iron shown in Fig. 1.

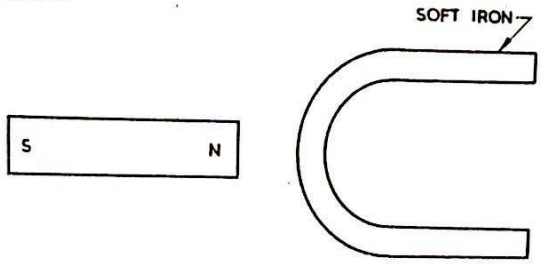


FIG. 1

(b) Fig. 2 shows two coils wound on a soft iron core XY and supplied with current from a cell. State the polarity of the ends X and Y of the core -

(i) when switch A is closed and switch B is open and

(ii) when B is closed and A is open.

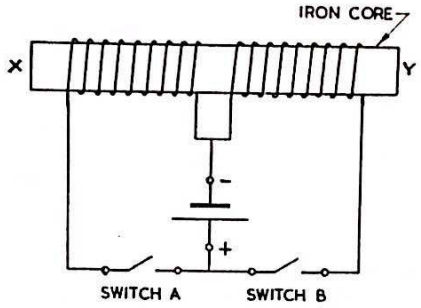


FIG. 2

2. (a) Define the "ampere".
(b) How long will it take to deposit 2·25 gm. of nickel in a voltameter using a current of 5 amp ?
(c) What quantity of electricity is required to do this ?

E.C.E. of nickel = 0·0003 gm./coulomb.

3. Give brief answers to five of the following:-

(a) What is the resistance of a 200V. 100W. bulb filament ?
(b) Name two magnetic materials, two non-magnetic materials, two conductors and two insulators.
(c) Why is it usually only necessary to add water to a secondary cell to maintain the level of the electrolyte ?
(d) In what units are each of the following measured: power, energy, quantity of electricity, resistance ?
(e) Which of the following coils has the fastest heating power:

Coil No. 1 : 1000 watt, 200 volt.
Coil No. 2 : 200 volt, 6 amp.
Coil No. 3 : 200 volt, 50 ohm.

(f) For how long will 6d. worth of electricity drive a 250 watt motor if the electricity costs 1½d. per unit ?

4. (a) Define the "ohm".
(b) Two resistors of 4 ohms and 5 ohms respectively are connected in series to a supply. The total current flowing is 2 amp. Calculate the total current flowing when a 12 ohm resistor is added to the circuit by connecting it in parallel with the 4 ohm one (the supply voltage remaining unchanged).

5. (a) When a cell of e.m.f. 2V. is used to supply current to a 9·5 ohm resistor, the terminal p.d. is 1·9V. Calculate:-

(i) the internal resistance of the cell,
(ii) the terminal p.d. when the cell is supplying 0·3 amp. to a circuit.

(b) Describe any type of primary cell with which you are familiar. Mention how polarisation is prevented in the cell you describe.

6. Explain what is meant by "electro-magnetic induction".
Describe an experiment which could be used to demonstrate electromagnetic induction. Show clearly the direction of current, magnetic field, etc. for the experiment you describe.

7. Explain how a transformer works and what it is used for

OR

Describe how a dynamo works. Name all the essential parts and state how each part helps in generating the current.