Practical No.1 Measure the parameters of simple electrical and identify presence of flux lines i magnetic circuit. (E.g. current, voltage, power, flux) 1C

I Practical Significance:

To measure the parameters of a simple electrical circuit and identify the presence of flux lines in magnetic circuit, you can use various instruments and techniques.

II Industry /Employer Expected outcome:

Apply basic concept of electrical and electronics engineering in various application in relevant technica fields.

III Course level learning outcome:

Calculate and measure basic electrical quantities and parameters.

IV Laboratory Learning outcome:

LLO Use electrical meters for measurement of electrical parameters.

LLO Identify presence of magnetic flux lines

V Relevant Affective Domain related outcome:

Follow safety electrical rules for safe practices.

VI Minimum Theoretical Background:

- Voltage describes the "pressure" that pushes electricity. The amount of voltage is indicated by a unit known as the volt (V), and higher voltages cause more electricity to flow to an electronic device.
- Current is a flow of electrical charge carriers, usually electrons or electron-deficient atoms. The common symbol for current is the uppercase letter I. The standard unit is the ampere, symbolized by A.
- We can define power as the rate of doing work, it is the work done in unit time. The S.I. unit of power is Watt (W) which is joules per second (J/s). Sometimes the power of motor vehicles and other machines is given in terms of Horsepower (hp), which is approximately equal to 745.7 watts.
- Magnetic flux is a measurement of the total magnetic field which passes through a given area. It is a useful tool for helping describe the effects of the magnetic force on something occupying a given area.

X Procedure:

A) Procedure Circuit for measurement of voltage, current and power

1. Connect the circuit as per circuit diagram.
2. Apply the voltage using autotransformer.
3. Measure the voltage, current and power of the circuit

B) Procedure Circuit for measurement of voltage, current and power

1. Connect two ends of the coil to the Galvanometer.
2. Take a bar magnet of known polarity.
3. Move the bar magnet in the coil as per the sequence given in observation table.
4. Observe the deflection of Galvanometer.

XI Resources used:

Sr. No.	Name of Resources	Suggested Broad Specification	Quantity
1	Autometer	Autotransformer 0-270V, 4A	1 No.
2	Voltmeter	0-250-500V	1 No.
3	Ammeter	0-5-10A	1 No.
4	Rheostat	100 ohm, 5A	1 No.
5	Inductor	Suitable inductor	1 No.
6	Wattmeter	0-750-1500-3000W	1 No.
7	Bar magnet	Bar magnet of known polarity	1 No.
8	Galvanometer	Suitable range	1 No.
9	Inductive coil	Any suitable coil having large number of turns.	1 No.

XII Actual Procedure followed:

A] 1. Connect the circuit as per circuit diagram.
2. Apply the voltage using auto transformer.
3. Measure the voltage, current, power of circuit.

B] 1. Connect two ends of the coil to the galvanometer.
2. Take a bar magnet of known polarity.
3. Move the bar magnet in the coil as per the sequence given in observation table.
4. Observe the deflection of galvanometer.

XIII Observation table for measurement for voltage, current and power.

Sr. No.	Voltage(V)	Current(A)	Power(W)
1	10 V	2 A	20 W
2	15 V	3 A	45 W
3	20 V	4 A	80 W

Observation table for identifying magnetic flux.

S.N.	Movement of Bar Magnet	Movement of the Magnet	Deflection of Galvanometer connected across coil	
			Forward / Reverse	Less/ More
1	Towards the coil	Slow	forward	less
2	Towards the coil	Fast	forward	more
3	Away from the coil	Slow	reverse	less
4	Away from the coil	Fast	reverse	less

XIV Results:

The flux in the coil will change if the magnet moves or if the current through the coil is varied. The flux density can be estimated using the area of the coil and the strength of the magnetic field.

XV Interpretation of Results (Giving meaning to the results):

by passing current through the coil or moving a bar magnet near the coil, you observe a measureble induced current and voltage this is a result of changing magnetic field which induced an electromotive force (emf) according to faraday's law of Induction.

XVI Conclusions (Actions to be taken based on the interpretations):

by passing current through the coil or moving a bar magnet near the coil you observe a measurable induced current and voltage this is a result of changing magnetic field which induced an electromotive force (emf) according to faraday's law of Induction.

XVII Practical Related Questions:

1. Define current.
2. Write the function of an ammeter.
3. Define voltage.
4. Write the function of voltmeter.
5. Define power.
6. Write the formula of power.
7. Define magnetic flux.
8. Define magnetic lines of force.
9. State Faraday's laws of electromagnetic induction.
10. Define flux density and write the symbol of the same.

Q.1 - - - - ?

→ Current : it is flow of electrons through conductor is called as current measured in Ampere.

Q.2 - - - - ?

→ The ammeter shows measure a current in circuit.

Q.3 - - - - ?

→ The potential difference between two point is known as voltage unit of voltage is volt.

Q.4 - - - - ?

→ To measure the voltage in voltmeter.

Q.5 - - - - ?

→ The product of voltage and current is called power.

Q.6 - - - - ?

→ P = VI

Q.7 - - - - ?

→ it is line of force through a medium from north pole to south pole to form flux. Unit = weber.

Q.8 - - - - ?

→ The imaginary lines which represents the direction of magnetic field are known as magnetic lines of force.

Q.9 - - - ?

→ following two faraday's law of electromagnetic induction.

i> first law : It states that whenever the magnetic lines of force linking with the conductor of coil changes an EMF get induced.

ii> Second law : The magnetic of the EMF is directy proportional to the rate of change in flux linkage.

Q.10 - - - - ?

→ The concentration of uniformly distributed flux per area of the cross section through which it acts is known as flux density.

XVIII References/suggestions for further reading:

1. https://www.sciencedirect.com/topics/engineering/circuit-parameter
2. https://study.com/academy/lesson/operating-simple-circuits-parts-functions.html
3. https://uomustansiriyah.edu.iq/media/lectures/5/5_2018_03_18!08_37_55_PM.pdf
4. https://byjus.com/physics/circuit-diagram/