PRACTICAL 8 STUDY OF RLC CIRCUIT

Structure

8.1 INTRODUCTION

In any electrical system energy transfer is due to the flow of current due to the applied voltage. Typically loads can be categorised as Resistive (R), Inductive (L) or Capacitive (C). Voltage is measured by employing voltmeters and current by employing Ammeters. This experiment tells us how to measure and lets one study the behaviour of a RLC circuit Finally a calculation of power factor is done,

8.1.1 Objectives

i) Study of variation of voltage Drop across various elements with current

ii) Determine power factor of the circuit and draw the phasor diagram.

8.2 EXPERIMENT

8.2.1 Apparatus Required

Rheostat	-100Ω, 4A
Capacitor	-10 uF, 250 V
Inductor	-1mH, 4A
Power supply	-220 V, 50 Hz, 1ϕ
Autotransformer	-220 V, 8A
Fuse wire	- 5A
Voltmeter	- MI -- 0 to 300 V – 4 No.
Ammeter	- MI – 0 to 10 A – 1 No.
DPST	- 1 No

8.2.2 Procedure

1. Connect the circuit as shown in the circuit diagram.
2. Put the rheostat in maximum position
3. Close DPST
4. Slowly increase Auto transformer output till (V) reads 200V

5 Record voltages and currents in the observation Table

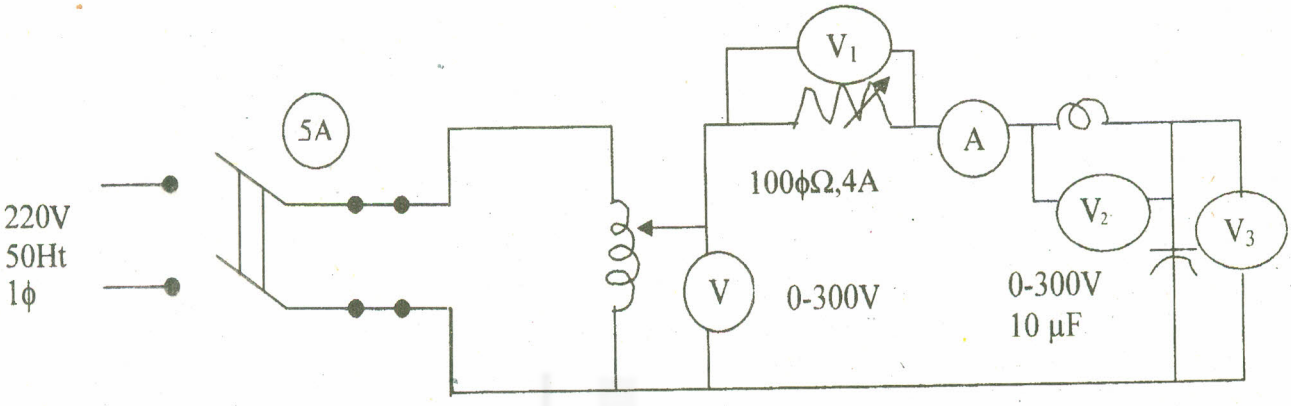
6 Reduce the resistance of the Rheostat and repeat step (5)

7 Repeat step (6) till current reaches 4A

8 Plot variation of V_1, V_2 and V_3 with current

9 Calculate power factor of the network

8.2.3 Circuit Diagram



8.2.4 Observations

Observation Table

Sl.No.	Current A (A)	Voltage V (V)	Voltage across		Power factor Cos ϕ
			Rheostat V_1 (V)	Inductor V_2 (V)	

8.2.5 Results

Calculate Power Factor

$$\cos\phi = \frac{V_1}{\sqrt{V_1^2 + (V_2 - V_3)^2}}$$

8.3 PRECAUTIONS

- Do not close the circuit without the permission of the Instructor
- Use Thick conductors for series circuit
- Use Thin conductors for Voltmeters
- Do not exceed the range of any instrument.