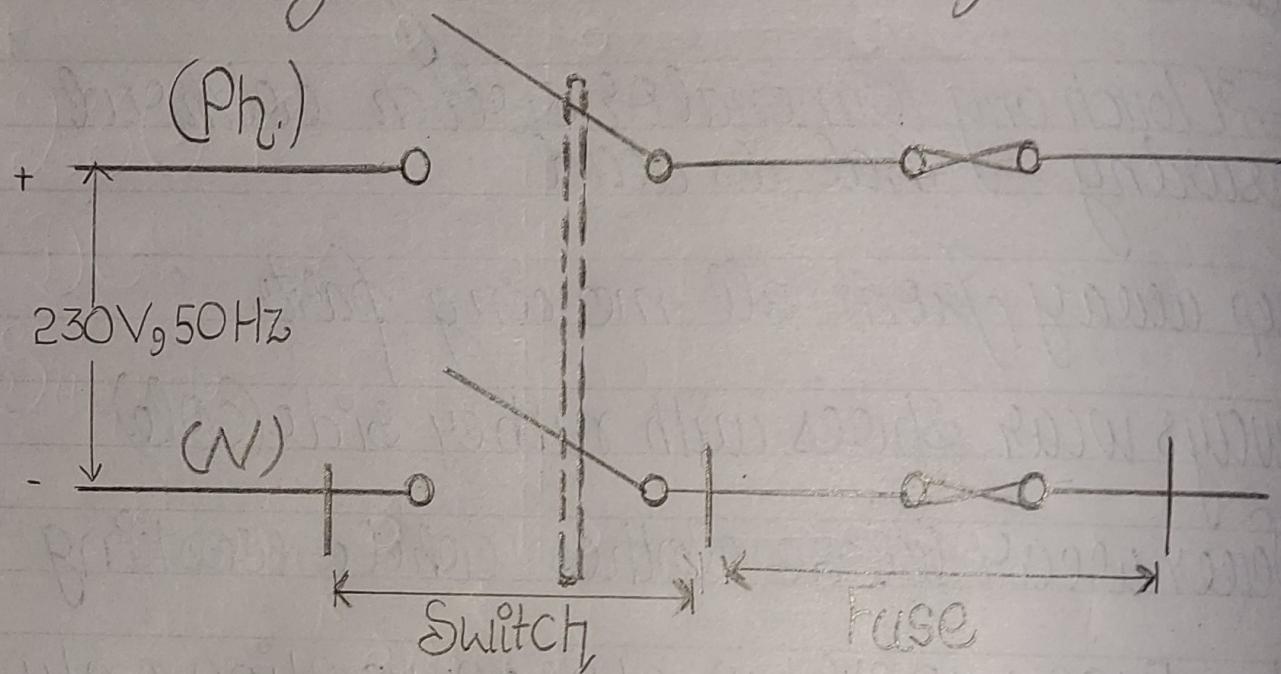


Basics of Experimentation

- 1) Purpose:- The following are the purposes of performing experiments in laboratories.
 - 2*) Getting familiar with basic components, measuring instruments & equipment.
 - 2*) Observe & Understand Basic Phenomenon
 - 3*) Verify Theorems & Laws
 - 4*) Get training in Technical Report writing
 - 5*) Study Important Characteristics of Apparatus
 - 6*) Get the knowledge of limitations of accuracies of measuring instruments
- 2) GENERAL INSTRUCTIONS:-
- Following instructions should be followed while working in a laboratory.

- 1.) Never work alone in the laboratory
- 2.) Don't touch any terminal or switch without insuring that its dead.
- 3.) Keep away from all moving parts
- 4.) Always wear shoes with rubber side(sole)
- 5.) Never wear loose clothes while working
- 6.) Use FUSE WIRE/MCB of proper rating only
- 7.) Make sure that electrical connections are right & tight.
15
- 8.) Circuit should be SWITCHED-OFF before changing any connection.
- 9.) Use sufficiently long wires, rather joining two or three small ones. In this you have open points which are DANGEROUS
- 10.) Familiarize yourself with the shock-chart instructions.
25

e) Single Phase (230V, 50Hz)



3) Supply Systems

Available Supply System :-

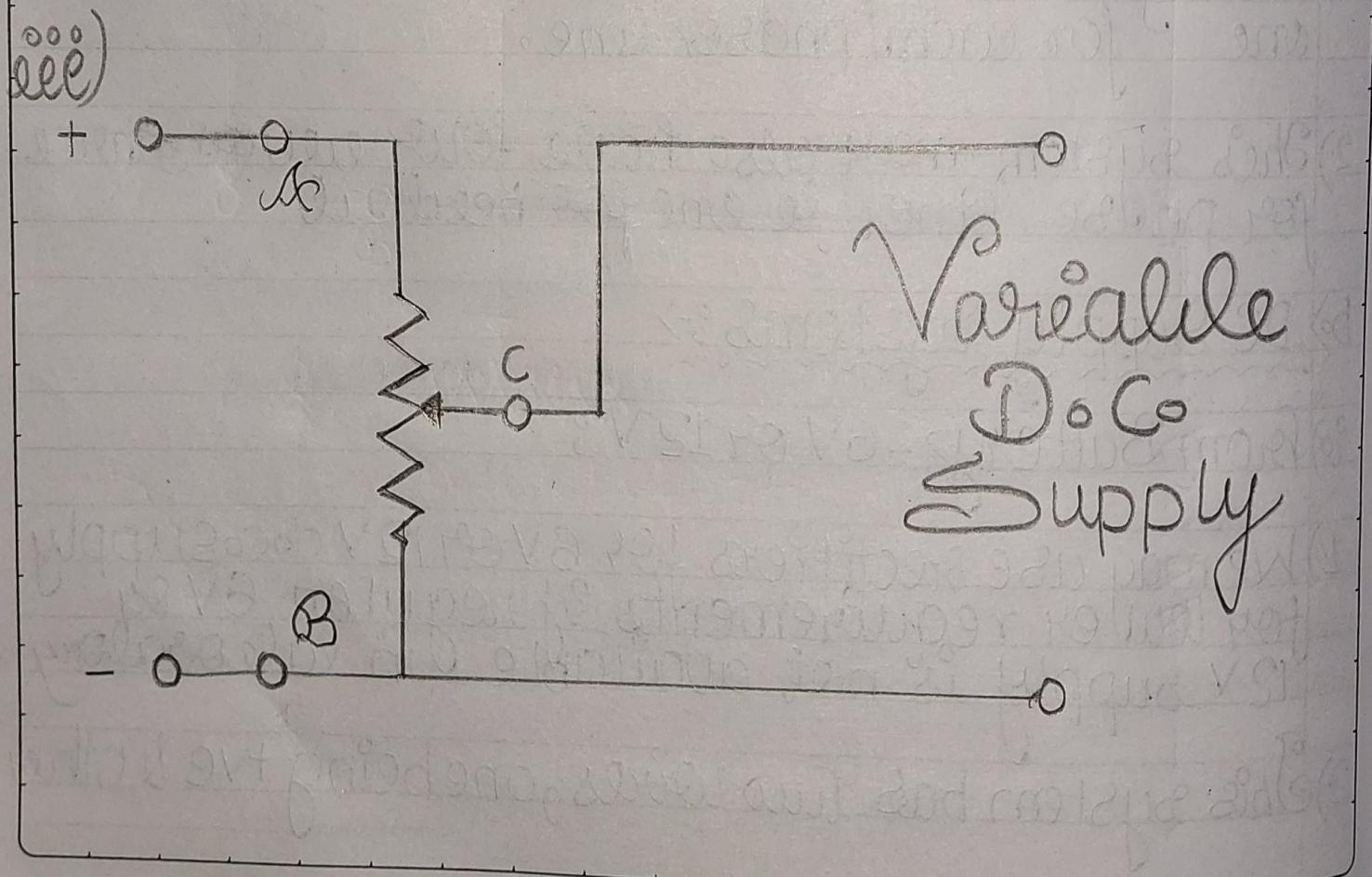
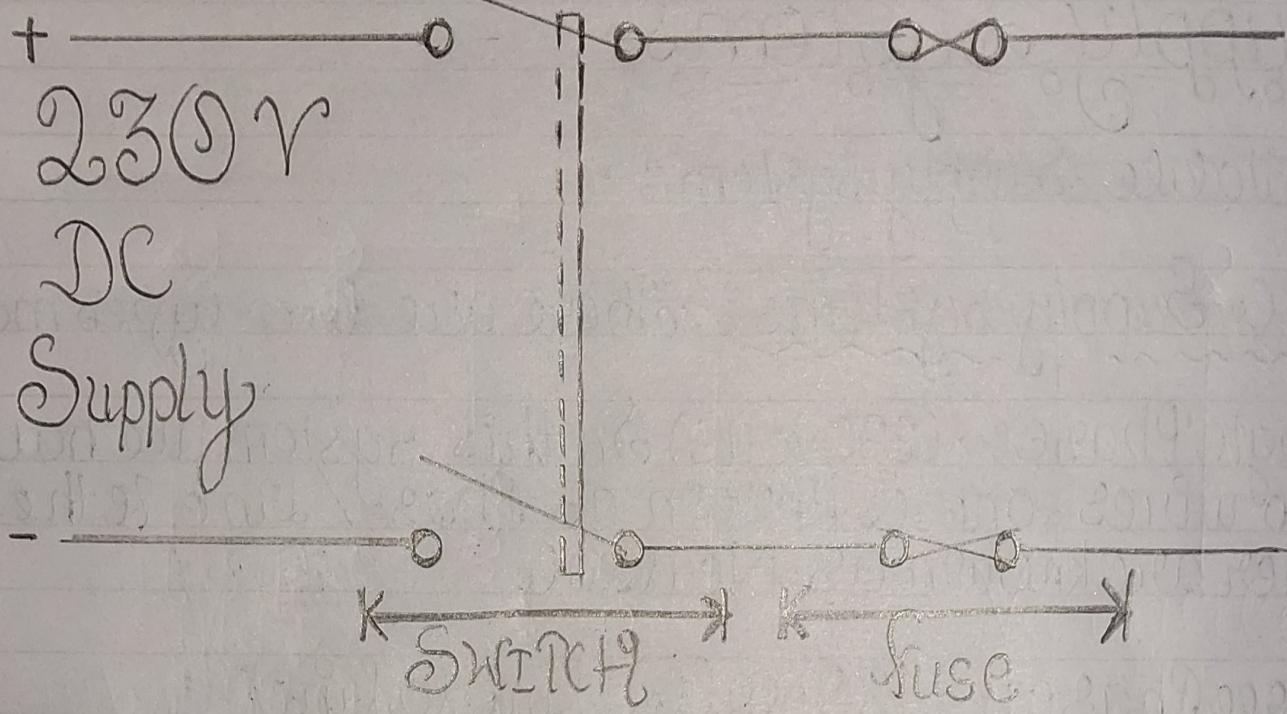
- a) AC Supply Systems :- There are three types mainly
- (i) Single Phase :- (230 Volts) In this system we have two wires, one is known as Phase / Line & the other are known as Neutral.
- (ii) Three Phase :- (430 Volts) (Line to Line)
- 1) This system may have line to line three wires, one for each phase / line.
 - 2) This system may also have four wires, three for phase / line & one for neutral.

b) DC Supply Systems

i) From Battery - 6V or 12V

- 1) We may use rectifiers for 6V or 12V DC supply for lower requirements if regular 6V or 12V supply is not available in laboratory
- 2) This system has two wires, one being +ve & other

(o^{oo}) D.C. GENERATOR



-ve.

ii) From D.C Generator (or A.C & Rectifier)

1) It is 230 volts D.C.

2) It has two wires one being +ve & other being -ve.

10 Systems to obtain Voltage (Variable)

Supply from the available Supply system.

15 a) D.C circuit \Rightarrow It consists of tubular.

resistance having three terminals.

The two end terminals A and B are.

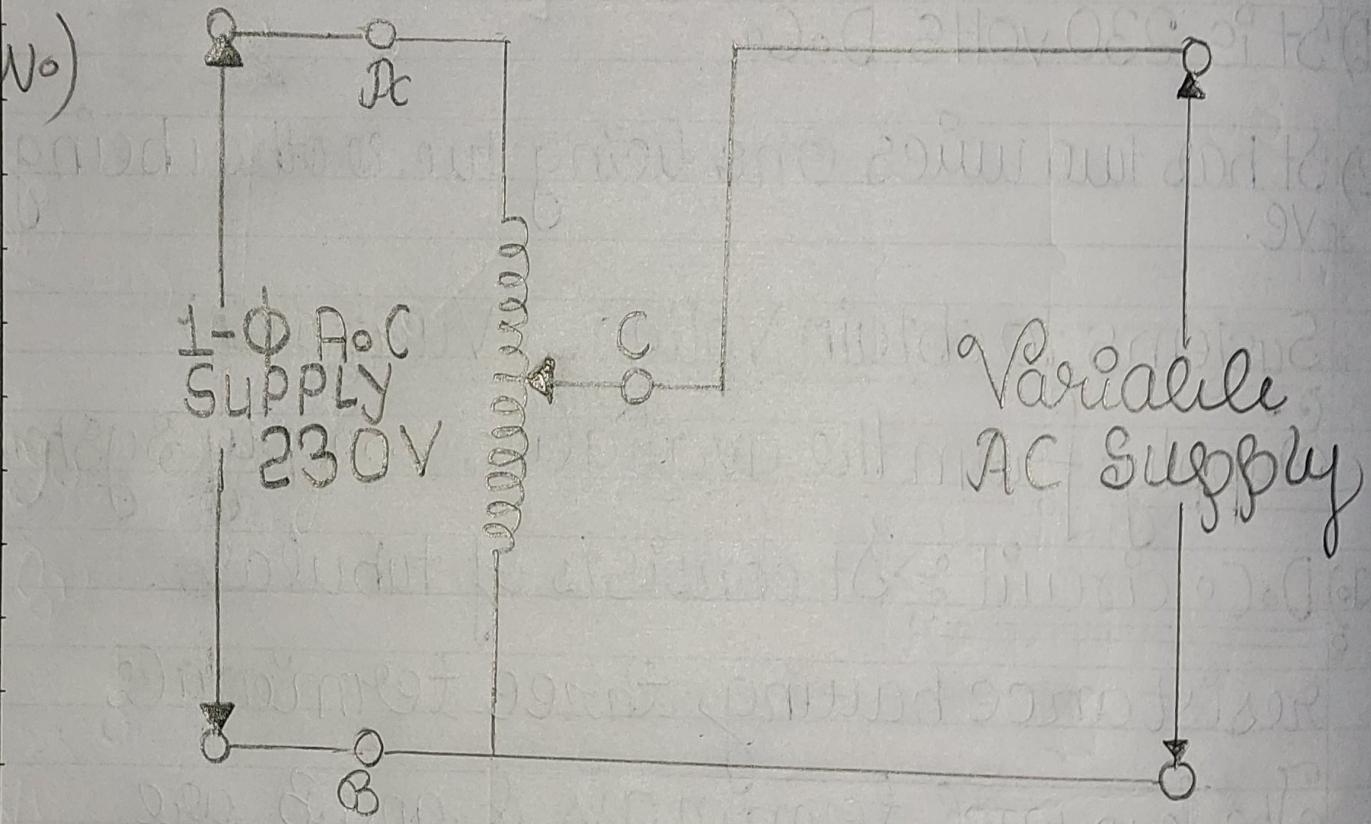
fixed and represent the two ends of a

resistance. The third terminal 'C' is a

moving contact with slides over AB.

25 The fixed D.C voltage applied across AB

in)



and a variable DC voltage across CB where C is positive and B is negative is obtained, when the sliding contact C is at B and A, the D_oC_o voltage is zero & equal to supply voltage respectively.

b) A.C. Circuit:- We can get A_oC_o voltage by replacing a rheostat by auto-transformer also known as, variac/Dimmersstat

It is a coil wound on a magnetic core with its two ends A and B brought out and sliding contact C.

It is capable of providing output voltage ranging from 0 to 1.15 of the full input voltage.

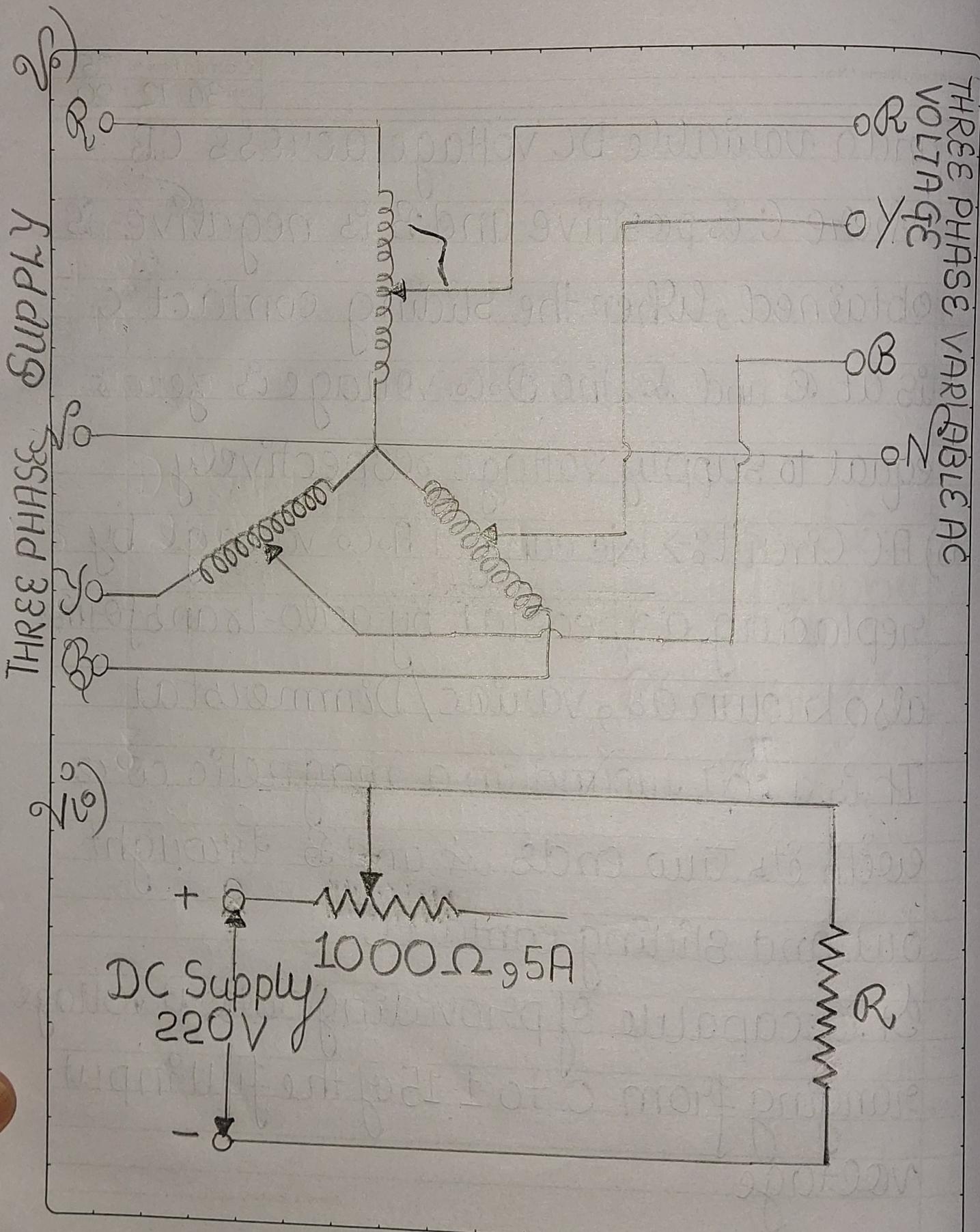
THREE PHASE VARIABLE AC

R_x

V_x

B

Z



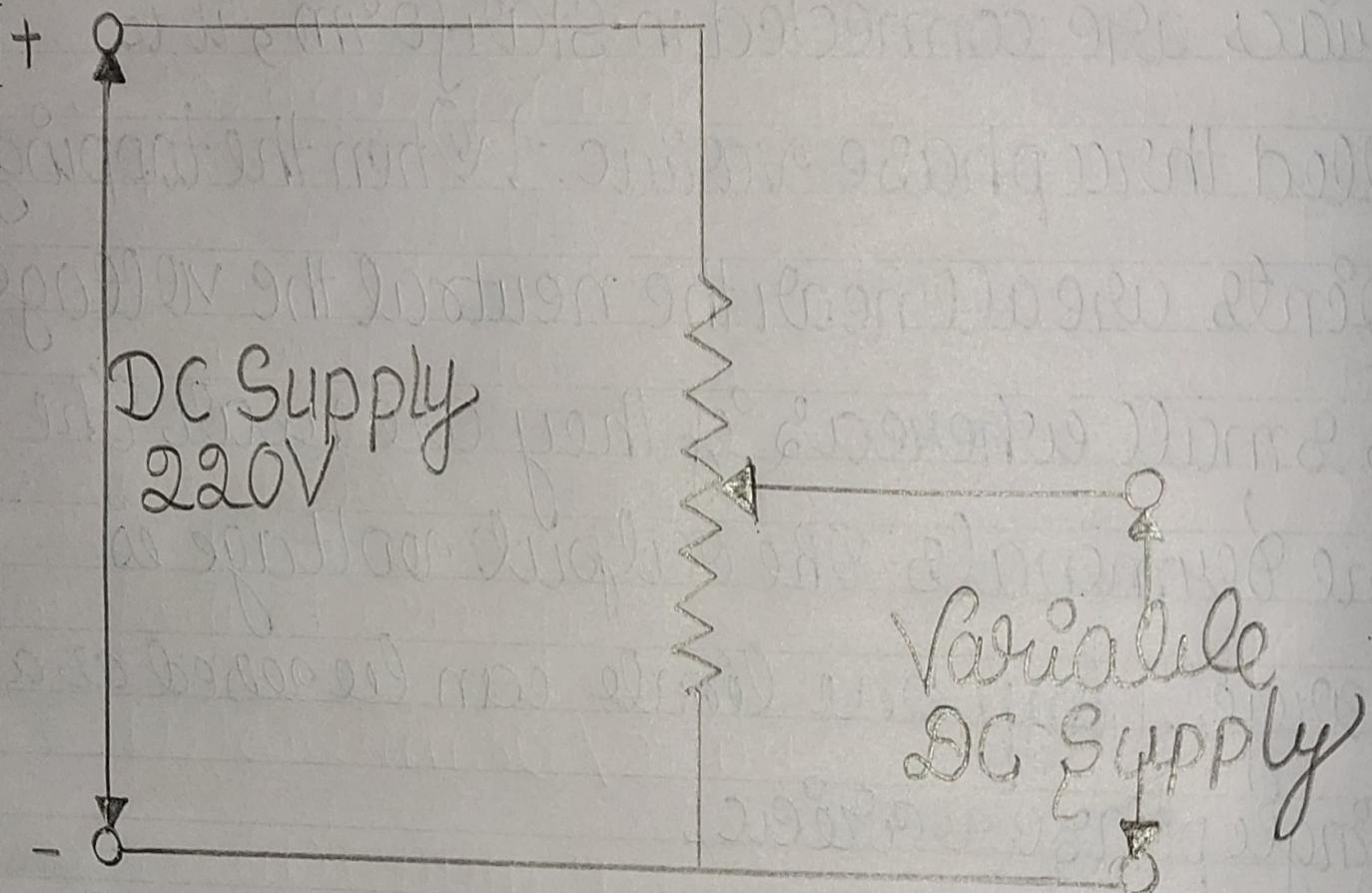
c) Three Phase circuit :- If three single phase variacs are connected in star form, it is called three phase variac. When the tapping points are all near the neutral the voltage is small whereas if they are near the line terminals the output voltage is large. Any one limb can be used as a single phase variac.

Rheostat :-

The salient features of a rheostat are :-

1) Made up of high resistivity materials like nickel-chromium-iron alloy closely wound over a circular tube

(29°c)



- 2) Available in single and double pole
- 3) Inter turn insulation is provided to avoid short circuiting of the turns
- 4) These are employed at places where resistance of circuit is to be varied without breaking the circuit
- 5) Normally it is 1000Ω , 1.2A and 100A (amperes)