BIHER INDIA — TO THE STARS BY HARD WORK

Bharath

INSTITUTE OF HIGHER EDUCATION AND RESEARCH

(Declared as Deemed-to-be-university under section 3 of UGC Act 1956)

A GRADE ACCREDITED BY NAAC — NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL

BHARATH INSTITUTE OF SCIENCE AND TECHNOLOGY

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Course B.TECH Branch CSE

Year 1st Semester I

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Certified to be the bonafide Record of work done by the above student in the U18ESEE1L3 Basic Electrical and Electronic Engineering laboratory during the 1st Semester in the Academic Year 2019 - 2020

Hailma 16/11/19

Signature of the Lab-in-charge

Signature of the Head of Dept

Submitted for the practical examination held on 30/11/19

Hailma

Internal Examiner

External Examiner

INSTRUCTIONS FOR MAINTAINING THE RECORD NOTE BOOK

1. The Record should be written neatly in ink on the pages of the right handside and the diagrams / drawings to be drawn on the pages of the left hand side in pencil.

2. Every Experient should begin on a new page.

3. The right hand side pages of the record should contain :

   I. Sl. No. and date of performance of the Experiment in the margin at the top

   ii. Experiment No. and the title of the Experiment on the first line followed by

   iii. Aim of the Experiment

   iv. A list of apparatus required

   v. Description of the apparatus.

   vi. Theory of the Experiment in brief

   vii. Inference of the result.

4. The left hand side pages of the Record should contain :

   I. Neat sketches of apparatus used and full page graphs wherever possible.

   ii. Diagrams of Electrical connections neatly drawn,

   iii. Oservation (to be entered in a tabular form neatly wherever possible)

   iv. A detailed accound of manipulation.

Electrical

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2.	6-9-19	Stair case wiring	3-4	10	[illegible]
3.	20-9-19	Measurement of energy using single phase energy meter	5-6	10	[illegible]
4.	11-10-19	verification of ohm's law	7-8	10	[illegible]
5.	1-11-19	verification of kirchoff's voltage law	9	10	[illegible]
6.	15-11-19	verification of kirchoff's current law	10	10	[illegible] 15/11

Completed

[illegible] 15/11

Electronics

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4.	29-9-19	verification of Half wave and full wave rectifiers	8-11	10	A
5.	18-10-19	Applications of OP-AmP	12-14	10	A
6.	8-11-19	Characterstics of BJT in CB configuration	15-17	10	A

Completed
Haika
15/11/19

Expt. No. 1
Date : 9-8-19

FLUOROSCENT LAMP WIRING

AIM:-
To prepare wiring for a flouroscent tube light with switch control.

Tools required:-

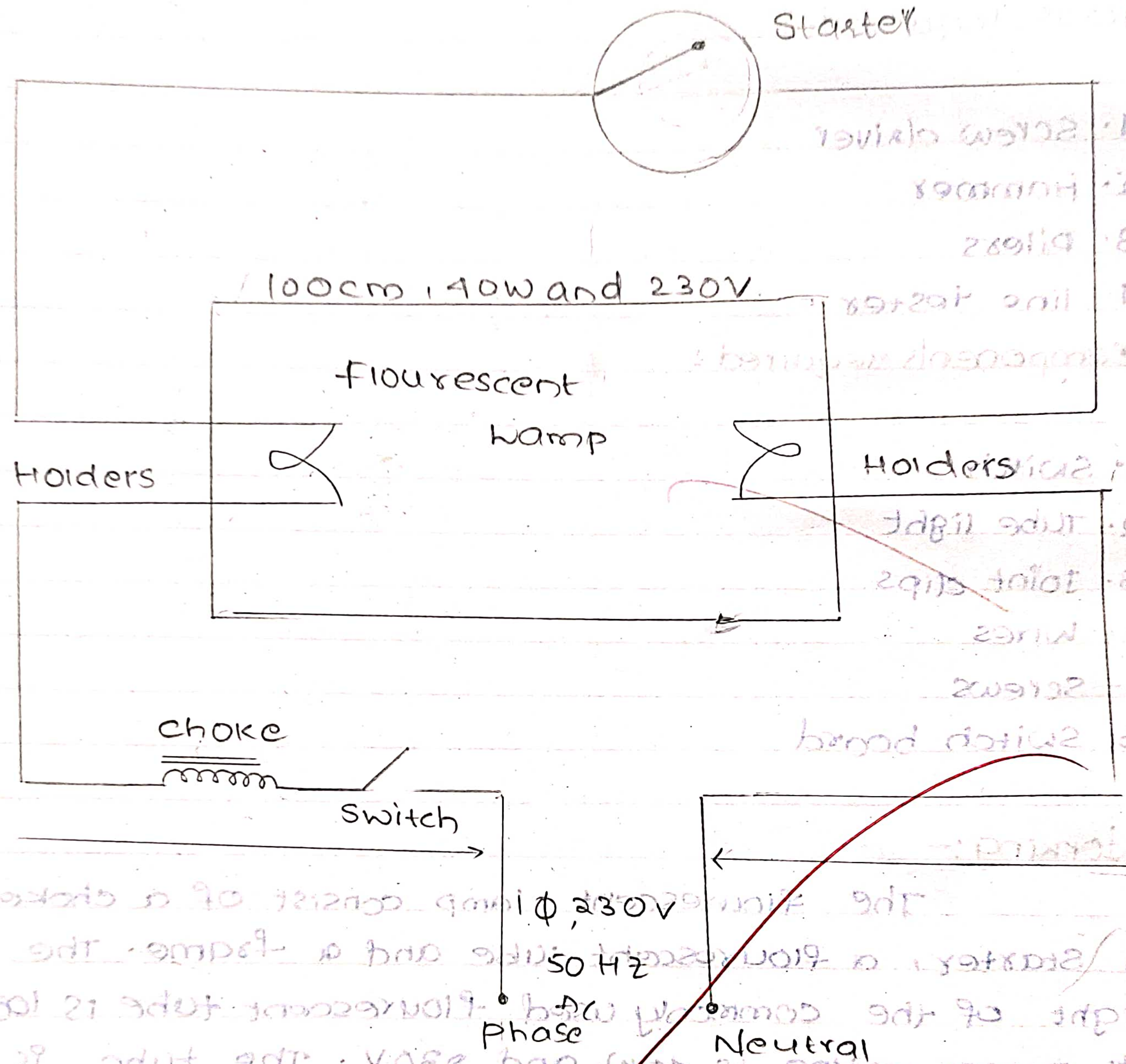
1. screw driver
2. Hammer
3. pilers
4. line tester

components required:-

1. switch
2. Tube light
3. Joint clips
4. wires
5. screws
6. switch board

Working:-
The flourescent lamp consist of a choke, a starter, a flouroscent tube and a frame. The light of the commonly used flourescent tube is 100cm its power rating is 40W and 230V. The tube is filled with argon and a drop of Mercury. When the supply is switched on, the current heats the filaments and intiates, the emission of electrons. After one or two seconds, the starter circuit opens and makes the choke to introduce a momentry high voltage surge across the two filaments.

Circuit diagram - Tube light :-



Expt. No.
Date :

Ionisation takes place through argon and produce bright light.

Procedure:-

1. Mark the switch and tube light location points and draw lines for wiring on the wooden board.

2. place wires along the lines and fix them with the help of clips.

3. fix the switch and tube light fitting in the marked position.

4. Complete the wiring as per the wiring diagram.

5. Test the working of the tube light by giving electric supply to the circuit.

~~Result!~~

Result:-

The wiring for the tube light is completed and tested.

Expt. No. 2
Date : 6-9-19

Page No. 3

2. STAIR CASE WIRING

Aim:-

To wire for stair case arrangement using a two way switch.

Tools Required:-

1. Screw driver
2. Hammer
3. pliers
4. line tester

components required:-

1. Two way switch 2. Bulb holder 3. Bulbs 4. joint clips 5. wires 6. screws 7. ceiling rose 8. Switch board.

Procedure:-

1. Make the bulb and bulb location points and drawn lines for wiring on the wooden board

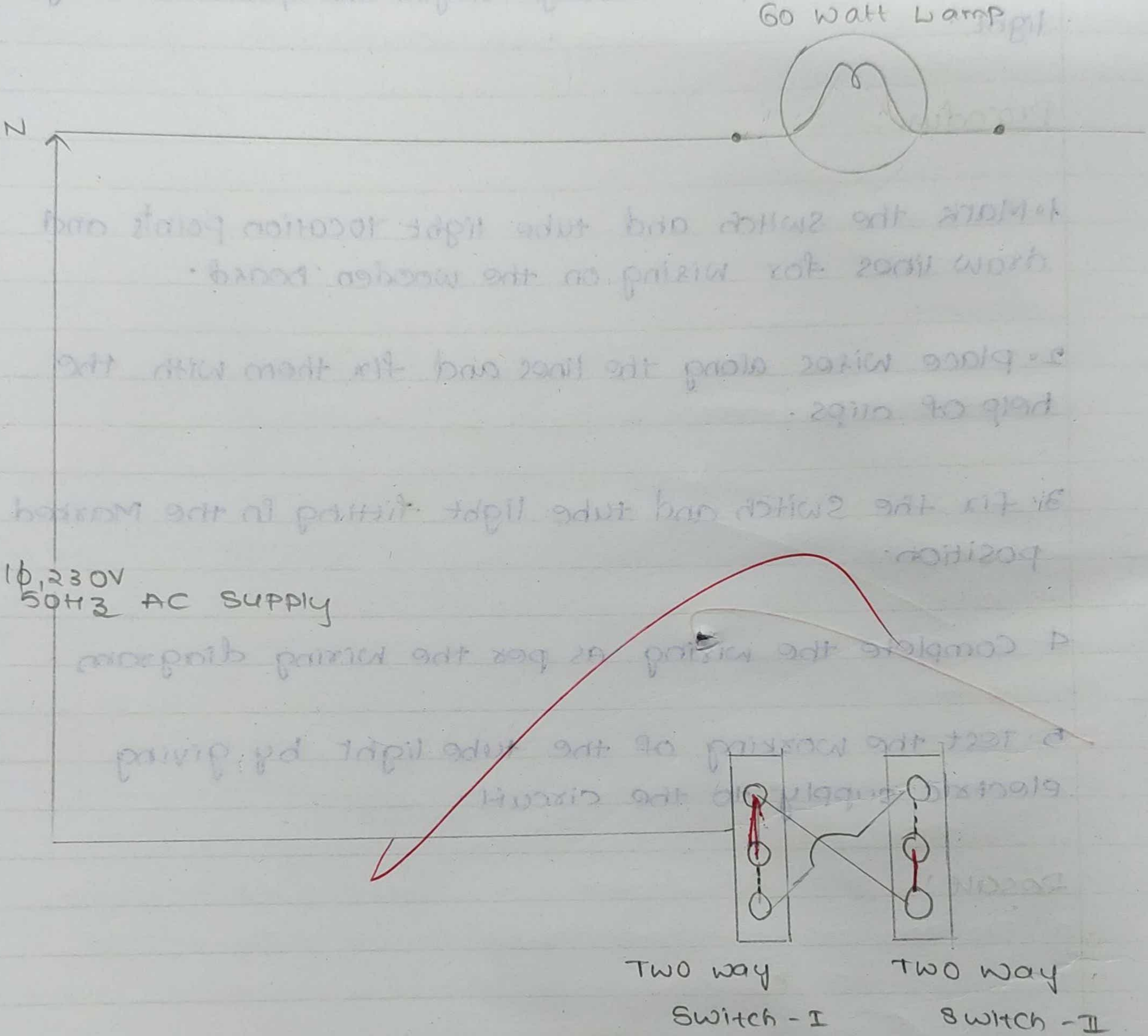
2. place wire along the line and fix them with the help of clips.

3. Fix the two way switches and bulb holder in the marked position on the wooden board.

4. complete the wiring as per the wiring diagram.

5. Test the working of the bulb by giving electric supply to the circuit.

Circuit diagram :-



Tabulation:

Switch position		Lamp condition
Switch - 1	Switch - 2	
OFF	OFF	OFF
ON	OFF	ON
OFF	ON	ON
ON	ON	OFF

Expt. No.
Date :

Theory:

A two way switch is installed near the first step of the stairs, the other two way switch is installed at the upper part, where the stairs the light point is provided b/w first and east stair at an aquoes adequate location and height. If the lower switch switches on the light, the switch at the top or vice versa on switch. It off two numbers of two way switches are used. for the purpose the supply is given to the switch at the short circuited terminals the for the second switch other two terminals of each circuit are connected through cables.

Result: The stair case wiring is completed are tested.

3. MEASUREMENT OF ENERGY USING SINGLE PHASE ENERGY METRE

Aim :- To measure the energy consumed in a single phase circuit using energy metre.

Apparatus required :-

S.NO	components required	Range	Type	Quality
1.	Ammeter	0 to Amp	MI	1
2.	Load	- - - - -	(Amp)	- - -
3.	voltmeter	0 - 30V	MI	1
4.	Energy meter	1Ph, 300V, 10A	-	1
5.	Auto transformation	1kVA, 230 (0-240)	1PH	1

Formula :-

1200 Rev = 1 KW

1 Rev = 1×1000 × 3000/1200 = 3000 (watt/sec)

For N Rev indicated energy (Es) = N×3000 (watts)

% Error = (Es - Eo) × 100 / Es

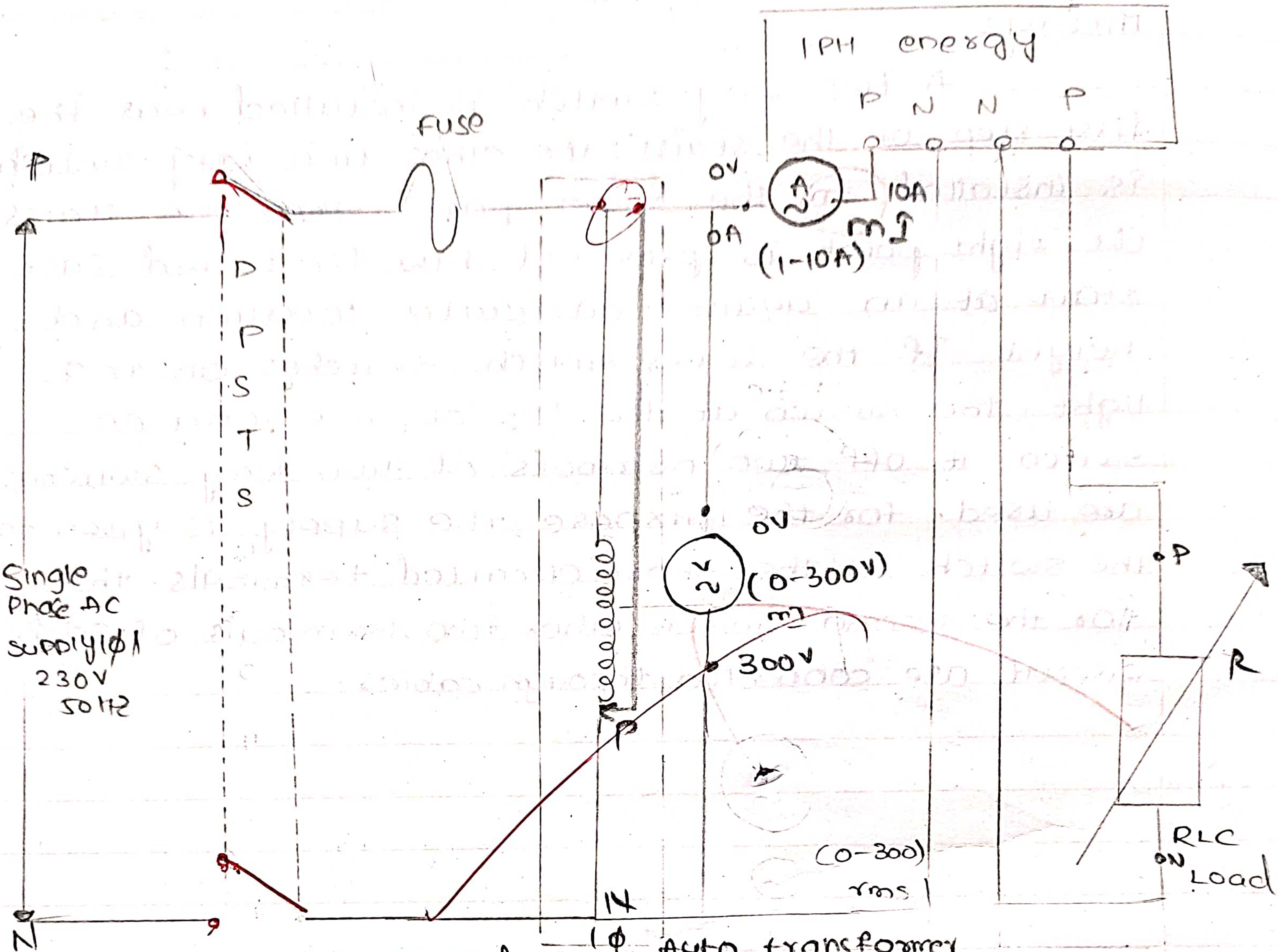
Calculated energy Ea × (Vc × Ic) × T (watt/sec)

where,

VL = Load voltage

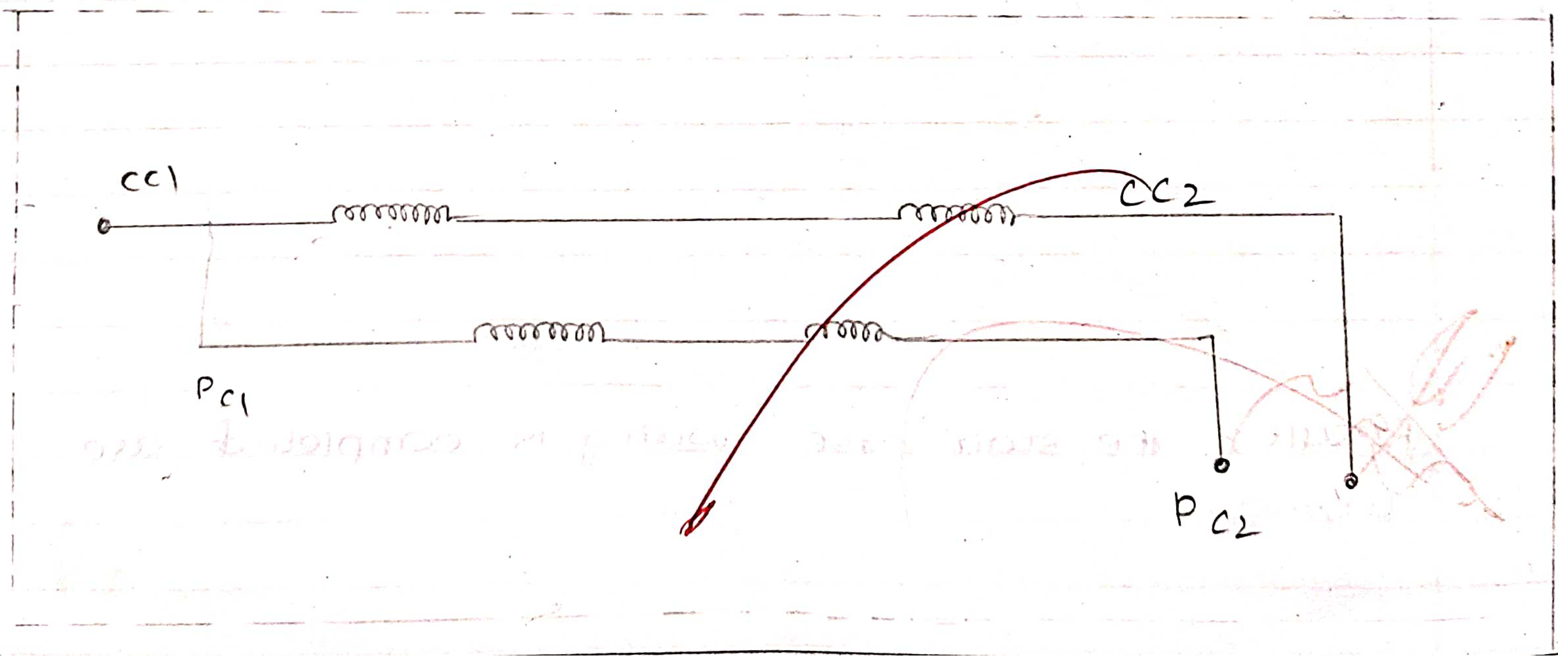
IL - Load current

Energy meter constant = 5 Rev/sec.



1 phase auto transformer 1Ø Auto transformer

Energy meter internal connection:-



Tabulation :-

S.NO	voltmeter reading (volts)	Ammeter reading (Amps)	time taken for 5 revs (sec)	calculated energy (sec)	Indicated Energy
1.	220	0	250	0	183000
2.	220	1.3	1120	34320	183000
3.	220	2.4	65	34320	183000
4.	220	2.5	60	33000	183000

$$\% \text{ error} = \frac{E_i - E_a}{E_i} \times 100$$

1) $\% \text{ error} = \frac{E_i}{E_i} \times 100 = 100\%$

2) $\% \text{ error} = \frac{E_i - E_a}{E_i} \times 100 = 81.24\%$

$= \frac{148680}{183000} \times 100$

3) $\% \text{ error} = \frac{E_i - E_a}{E_i} \times 100 = \frac{148680}{183000} \times 100 = 81.24\%$

4) $\% \text{ error} = \frac{E_i - E_a}{E_i} \times 100 = \frac{1,83,000 - 33000}{183000} \times 100 = 81.96\%$

procedure:-

1. connections are made as per circuit diagram.
2. supply is switch on and load is applied and ammeter voltmeter reading and note time taken by the disc for particular number of revolution are noted using stop watch.
3. step two is repeated for various load condition.
4. % error is calculated.

Result:-

The energy consumed in a single phase circuit is measured.

Expt. No. 4

Date : 11-10-19

VERIFICATION OF OHM'S LAW

Aim :-

To verify ohm's law for the given circuit.

Apparatus Required :-

S.NO	Apparatus	Range	Quantity
1.	RPS (Regulated power supply	(0-30) V	1
2.	Resistance	230Ω, 200Ω, 1KΩ	Each 1
3.	Ammeter	(0-30mA) mc	1
4.	Voltmeter	(0-30) vmc	1
5.	Bread Board wires	-	Required

Statement :-

At constant current temperature current flow through a conductor is directly proportional in the potential difference between the two ends of the conductor.

$$I \propto V$$

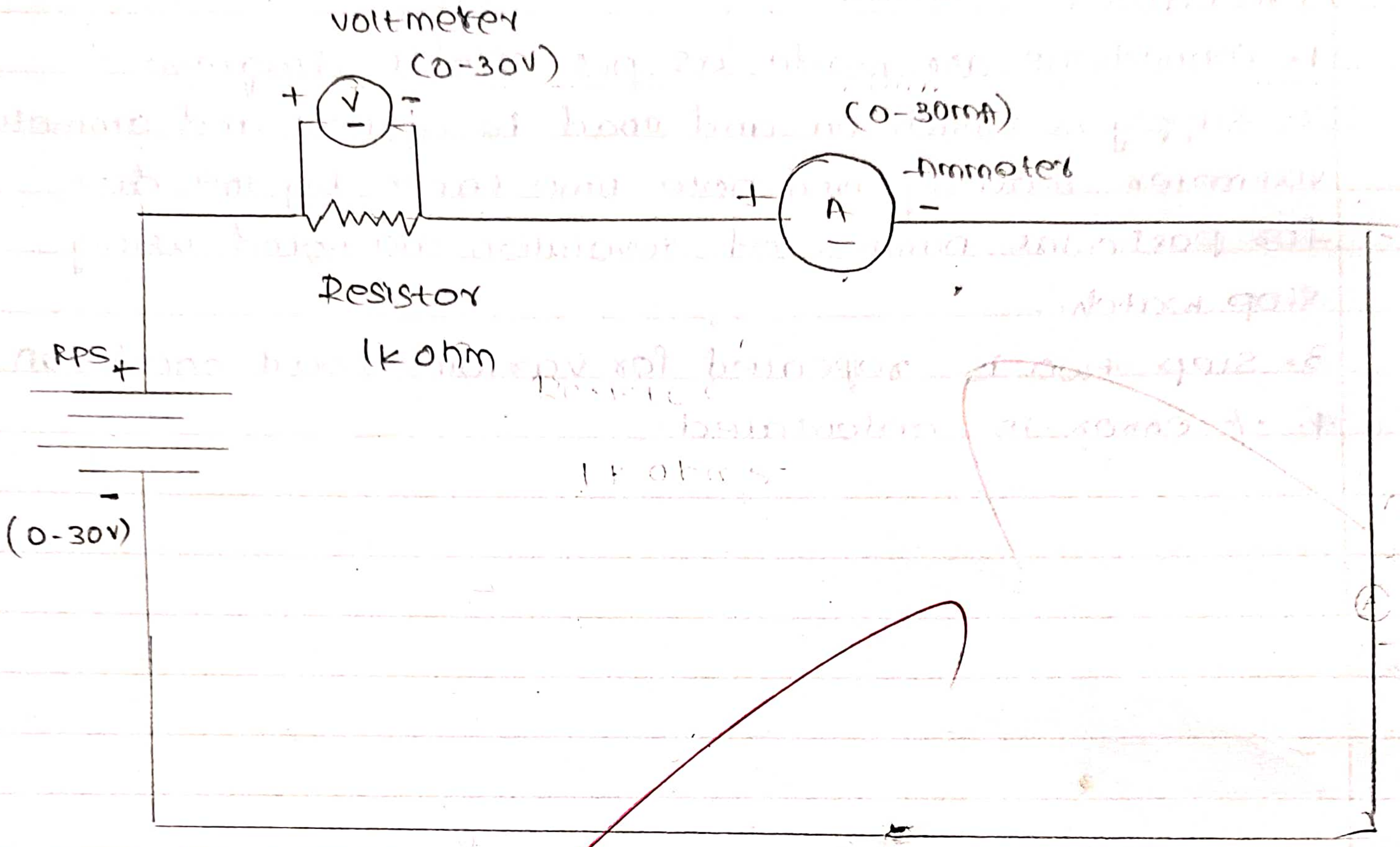
$$V = IR$$

Procedure.

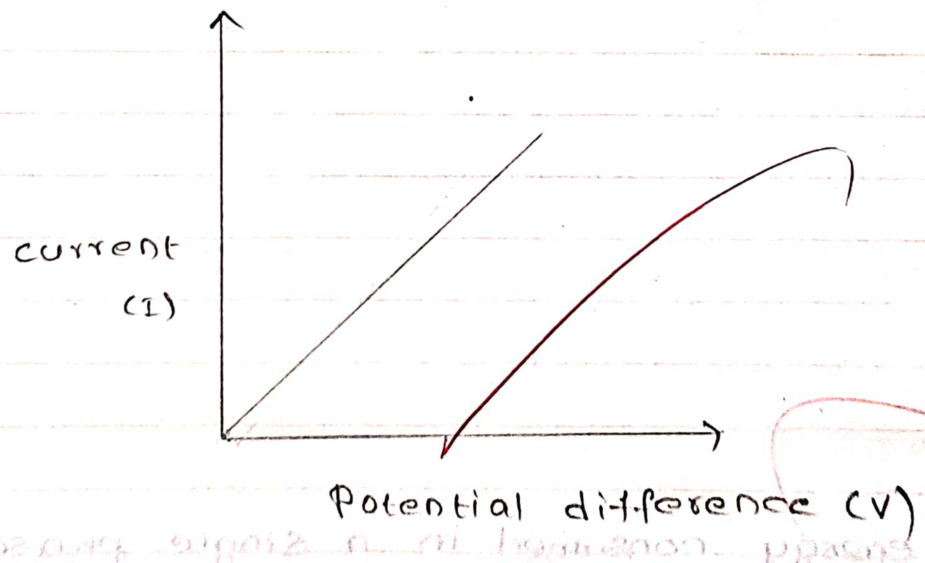
=> Draw the circuit diagram as shown above.

=> Arrange the apparatus as per the circuit diagram

=> Make the connections as per the circuit diagram All connections must be neat and tight. Take care to connect the ammeter and voltage with their correct policy. polarity. (+ve to +ve) and (-ve to -ve)



Model diagram:



Theoritical value

voltage (v)	current (I)
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10

Practical value.

voltage(v)	current (I)
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10

Expt. No.

Date :

=) Determine the zero error and least count of the ammeter and voltmeter and record them.

=) Adjust the RPS to get a small deflection in ammeter and voltmeter.

=) Record the recordings of ammeter and voltmeter.

=) Take atleast sets of readings by adjusting the RPS gradually.

=) plot a graph with V along x-axis and I along y-axis.

=) The graph will be straight line which verifies

=) Determine the slope of the V-I graph. The reciprocal of the slope gives resistance of the wire.

Result :-

Thus ohm's law is verified both practically and theoretically.

Expt. No. 5
Date : 1-11-19

VERIFICATION OF KIRCHOFF'S VOLTAGE LAW

Aim:

To verify kirchoff's voltage law for the given circuit

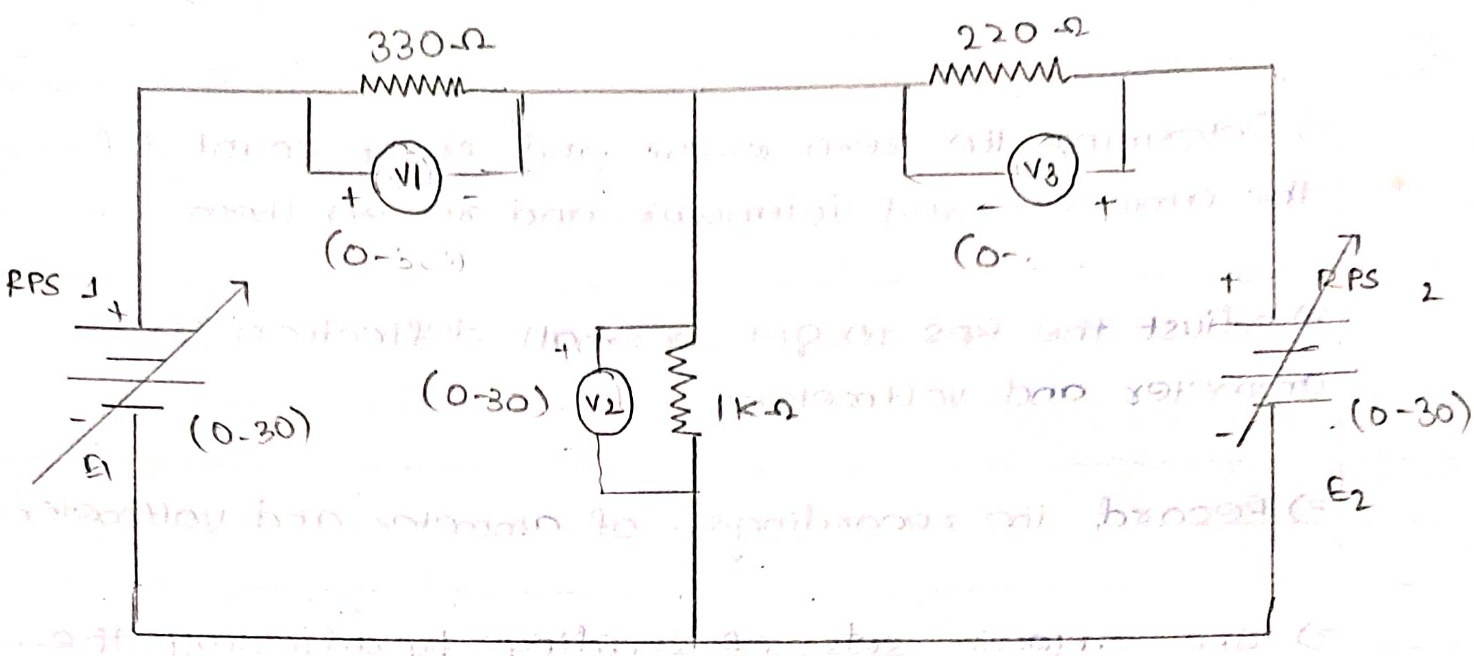
Apparatus required :-

Sl NO	Apparatus	Range	Quantity
1.	RPS (Regulated power supply)	(0-30V)	2
2.	Resistance	330Ω, 220Ω, 1KΩ	6
3.	Ammeter	(0-30mA) MC	3
4.	Voltmeter	(0-30V) MC	3
5.	Bread Board & wires	-	Required

Statement:

KVL: In any closed path/Mesh, the algebraic sum of all the voltages is zero.

Result:- Thus kirchoff's voltage law is verified both practically and theoritically.



KVL - Theoritical values

S.I NO	RPS		Voltage			KVL
	E1	E2	V1	V2	V3	E1 = V1+V2
	V	V	V	V	V	V
1	5	5	0.58	4.41	0.583	4.99
2	10	10	1.16	8.83	1.17	9.99
3	15	15	1.75	13.2	1.75	14.95
4	20	20	2.33	17.67	2.33	20
5	25	25	2.913	22.08	2.915	24.993

KVL- Practical values

S.I NO	RPS		Voltage			KVL
	E1	E2	V1	V2	V3	E1 = V1+V2
	V	V	V	V	V3	V
1	5	5	0.6	4.4	0.56	5
2	10	10	1.13	8.83	1.19	9.96
3	15	15	1.72	13.20	1.78	14.92

VERIFICATION OF KIRCHOFF'S CURRENT LAW

Aim: To verify kirchoff's current law for given circuit

Apparatus Required:

S.NO	APPARATUS	Range	Quantity
1.	RPS (Regulated power supply)	(0-30V)	2
2.	Resistance	330Ω, 220Ω, 1kΩ	6
3.	Ammeter	(0-30 mA) MC	3
4.	Voltmeter	(0-30V) MC	3
5.	Bread Board & wires	—	Required

Statement:

KCL: The algebraic sum of the currents meeting at a node is equal to zero.

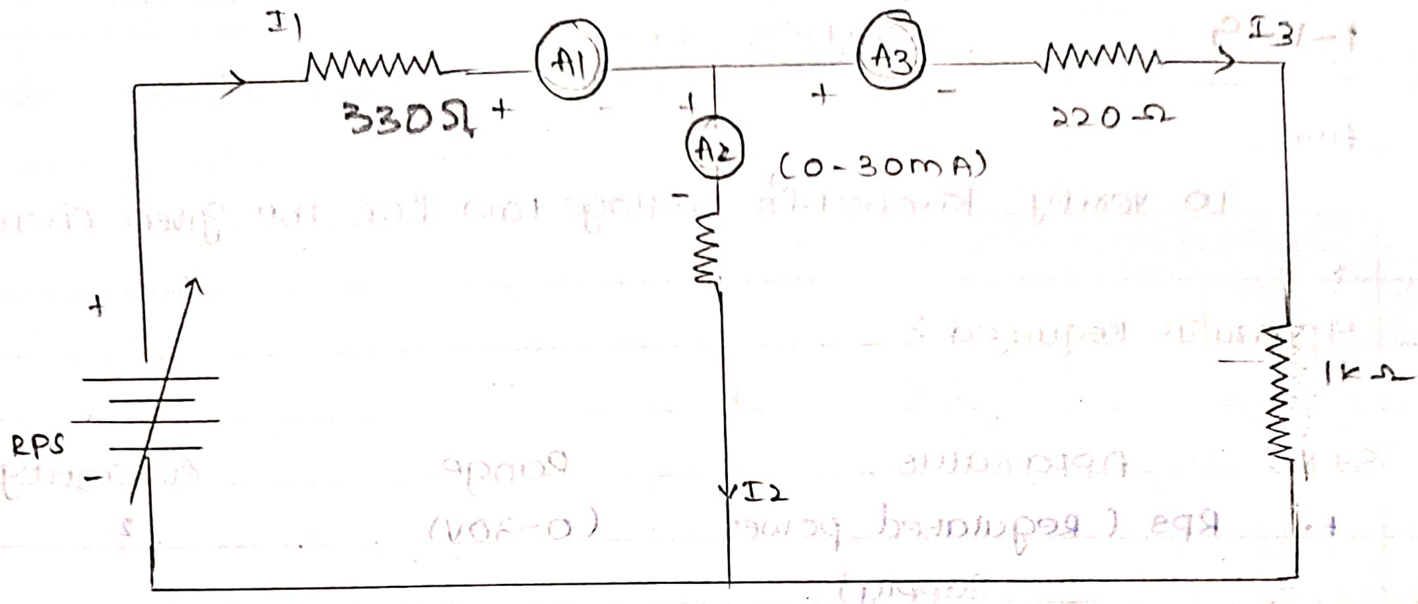
Precautions:

1. Voltage control knob should be kept at Minimum position
2. Current Control knob of RPS should be kept at Max position.

Procedure for KCL:

1. Give the connections as per the circuit diagram.
2. Set a particular value in RPS.
3. Note down the corresponding ammeter reading.
4. Repeat the same for different voltages.

Result: Thus kirchoff's current law is verified both practically and theoritically.



KCL- Theoritical value

S.NO	Voltage E volts	Current I_1 mA	I_2 mA	I_3 mA	$i_1 = i_2 + i_3$ mA
1	5	5.68	3.12	2.56	5.68
2	10	11.3	6.18	5.12	11.3
3	15	17.05	9.37	7.68	17.05
4	20	22.73	12.49	10.24	22.075
5	25	28.42	15.62	12.68	28.42

KCL- Practical value

S.I NO	Voltage E volts	Current i_1 mA	i_2 mA	i_3 mA	$i_1 = i_2 + i_3$ mA
1	5	5.6	3.1	2.2	5.3
2	15	17.2	9.9	7.6	17
3	25	28	15.6	12.7	28.3

Expt. No. 1
Date : 2-8-19

VERIFICATION OF LOGIC GATES

Aim:-

To construct OR, AND, NOT verify its truth table

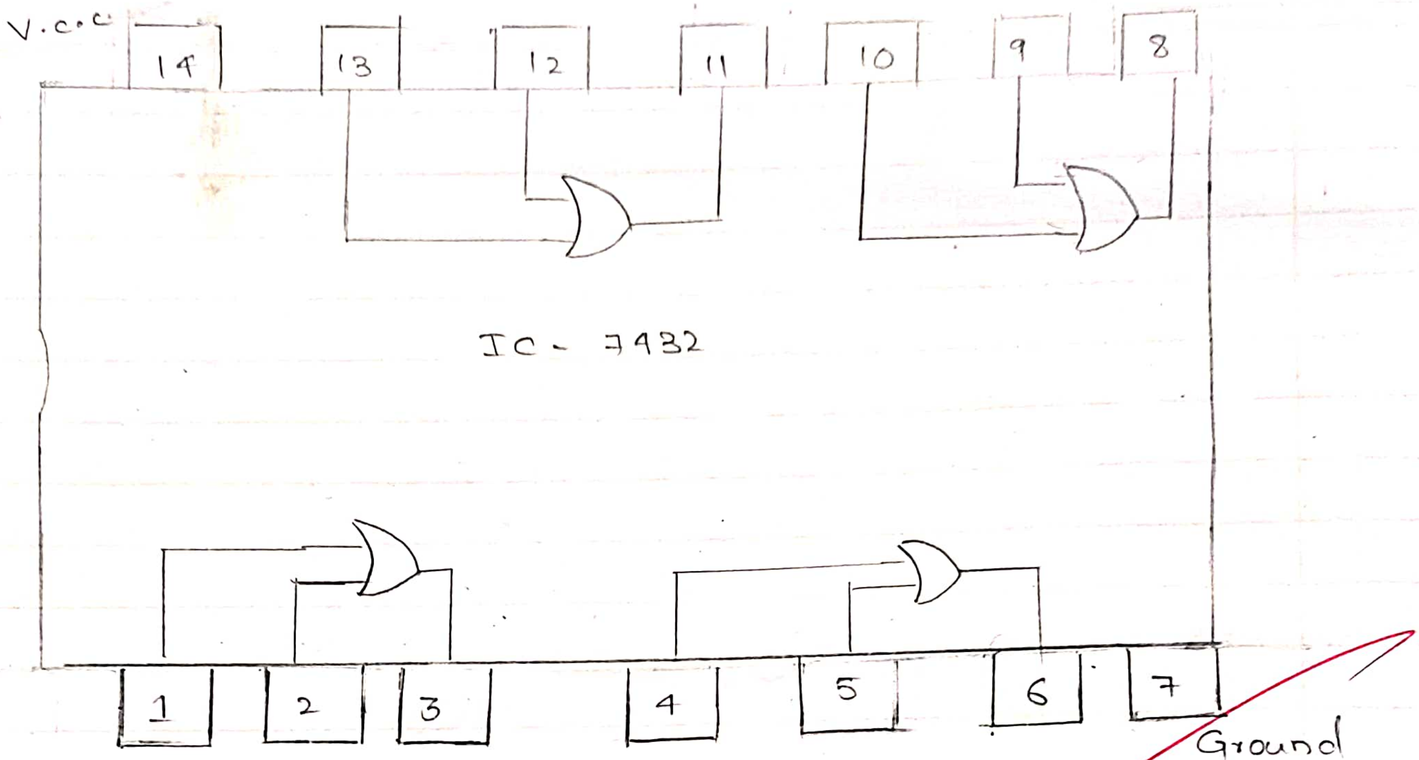
Apparatus required

1. OR GATE (IC-7432)
2. AND GATE (IC-7408)
3. NOT GATE (IC-7404)
4. NOR GATE (IC-7402)
5. NAND GATE (IC-7400)
6. EX-OR GATE (IC-7486)

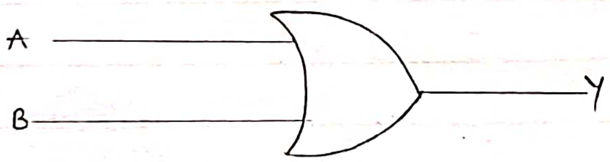
Procedure:-

1. connections are given as per the diagram.
2. The inputs A,B are given and the corresponding output is noted.
3. observe the LED condition for if LED grows, It Represents logic 1. otherwise logic 0.
4. The truth table is verified from the given table.

IC PIN diagram of OR gate :-



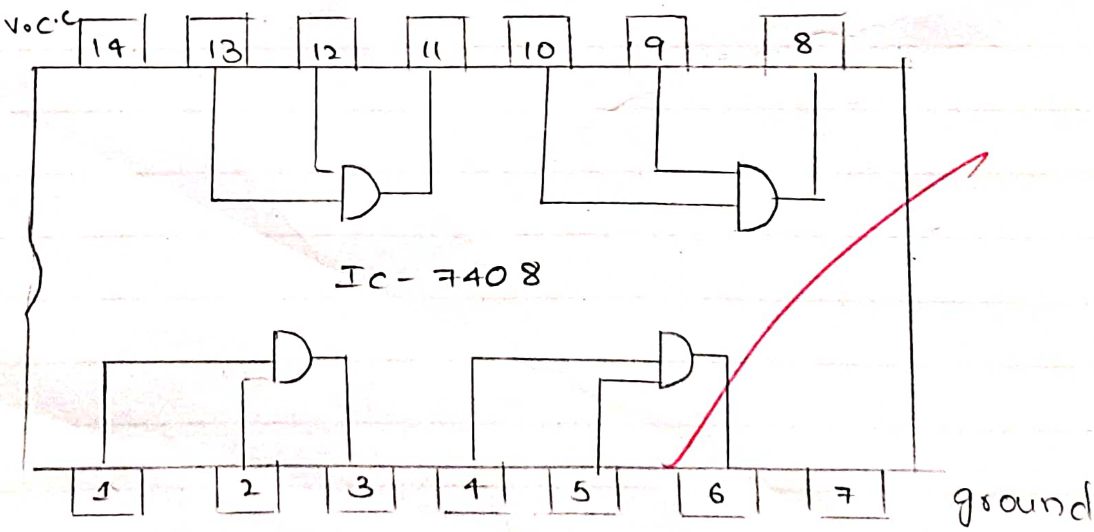
Logic gates diagram :-



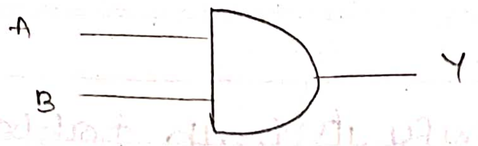
Truth Table

A	B	Y = A+B
0	0	0
0	1	1
1	0	1
1	1	1

IC PIN diagram of AND Gate :-



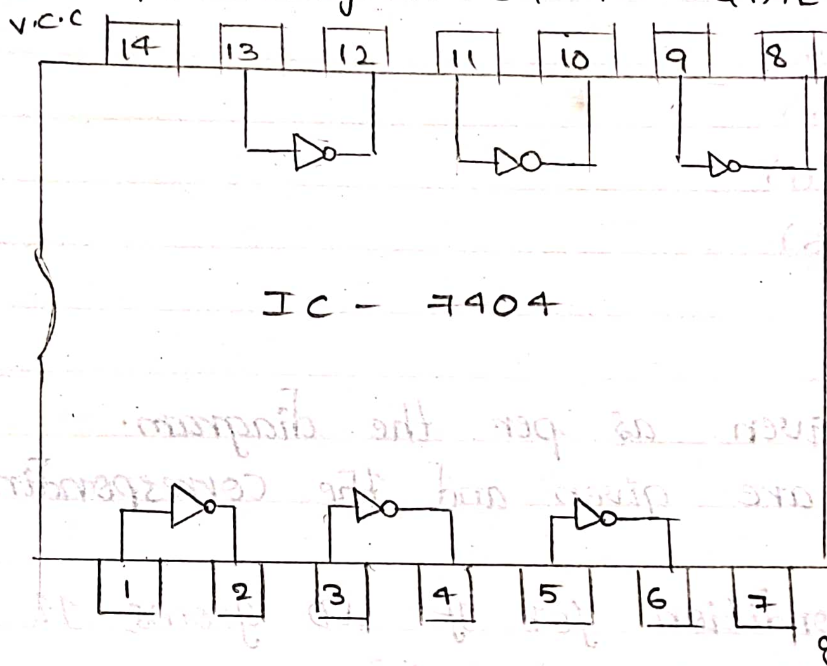
Logic gate diagram



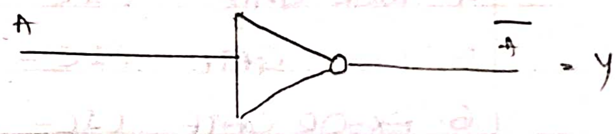
Truth Table

A	B	Y = A+B
0	0	0
0	1	0
1	0	0
1	1	1

IC PIN diagram of NOT GATE



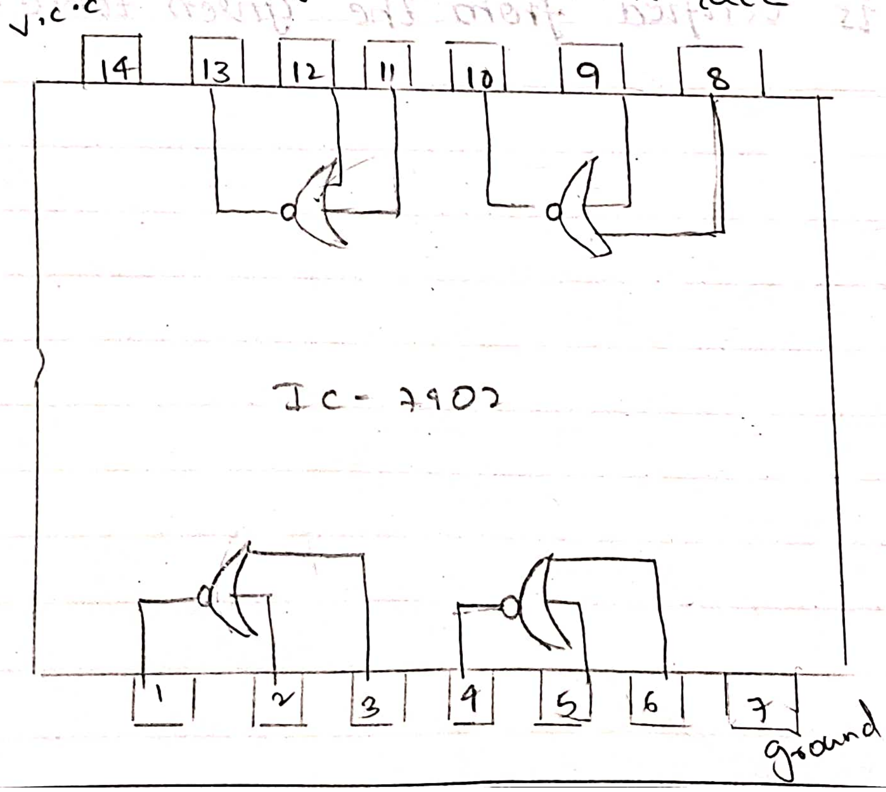
Logic Gate diagram



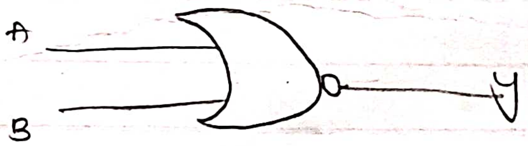
Truth table

A	Y = Ā
0	1
1	0

IC PIN digram of NOR Gate



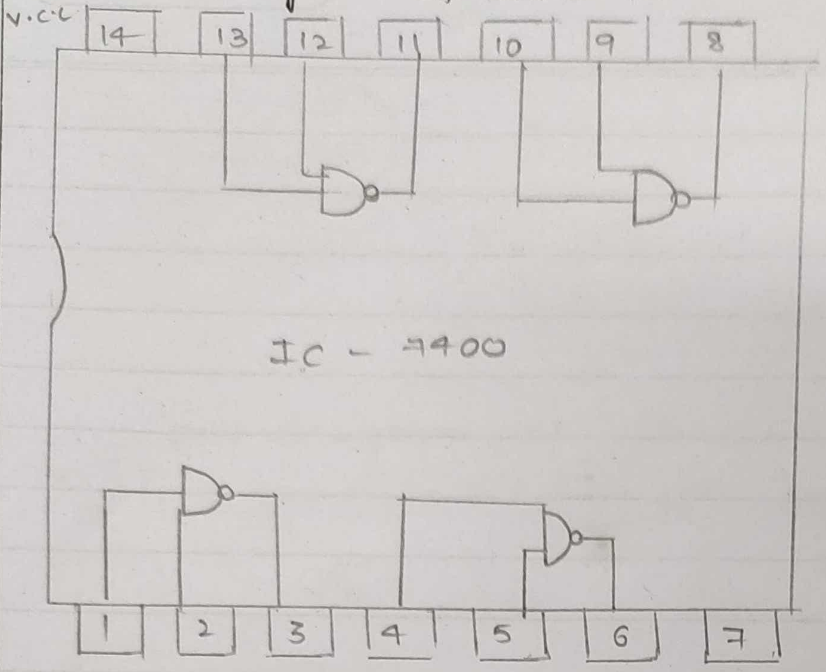
Logic gate diagram



Truth table

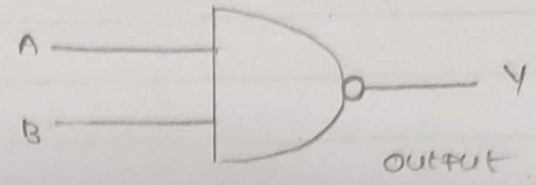
A	B	$Y = \overline{A+B}$
0	0	1
0	1	0
1	0	0
1	1	0

IC PIN diagram of NAND Gate



ground

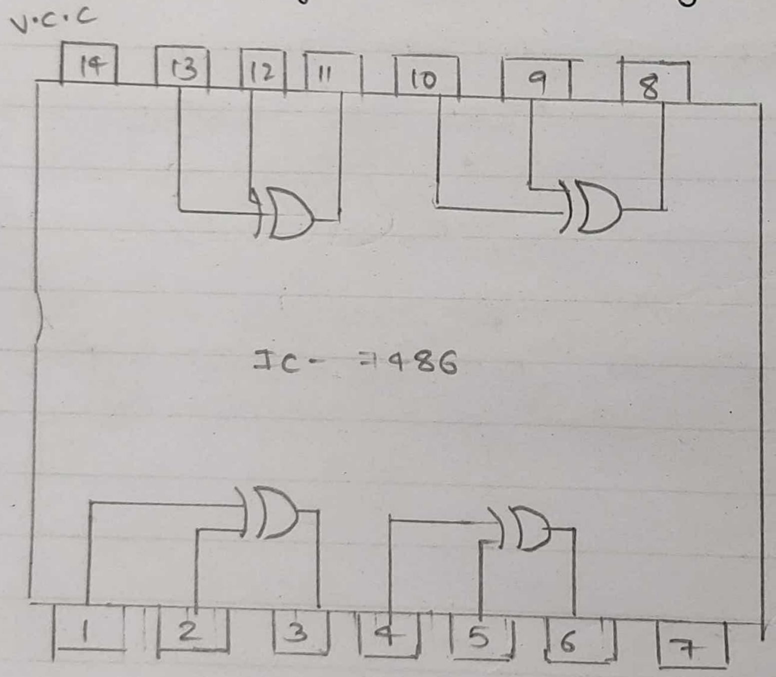
logic gates diagram



Truth table

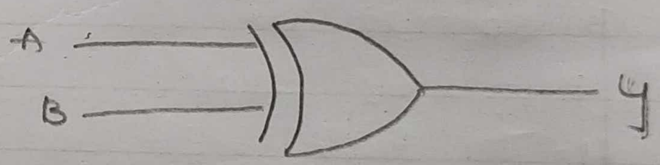
A	B	$Y = \overline{AB}$
0	0	1
0	1	1
1	0	1
1	1	0

IC PIN diagram of EX-OR gates :-



ground

Logic gates diagram



A	B	$Y = A \oplus B$
0	0	0
0	1	1
1	0	1
1	1	0

Result:

Thus, the OR, AND, NOT, NOR, NAND, EX-OR gate is tested and truth table has been verified.

Expt. No. 2. MEASUREMENT OF SIGNAL PARAMETERS USING CATHODE RAY OSCILLOSCOPE

Date : 30/8/19.

Aim:-

To measure the AC signal parameter using CRO
(i) voltage
(ii) Time period
(iii) frequency

Apparatus required :-
(i) CRO
(ii) function Generator (3MHz)

Theory of CRO:-

Typical CRO consists of following control.

(i) intensity knob:-
It control the brightness of the track.

(ii) DC/AC switch:
DC position provides direct coupling to the amplifier
AC provides capacitor in series input to block the DC component.

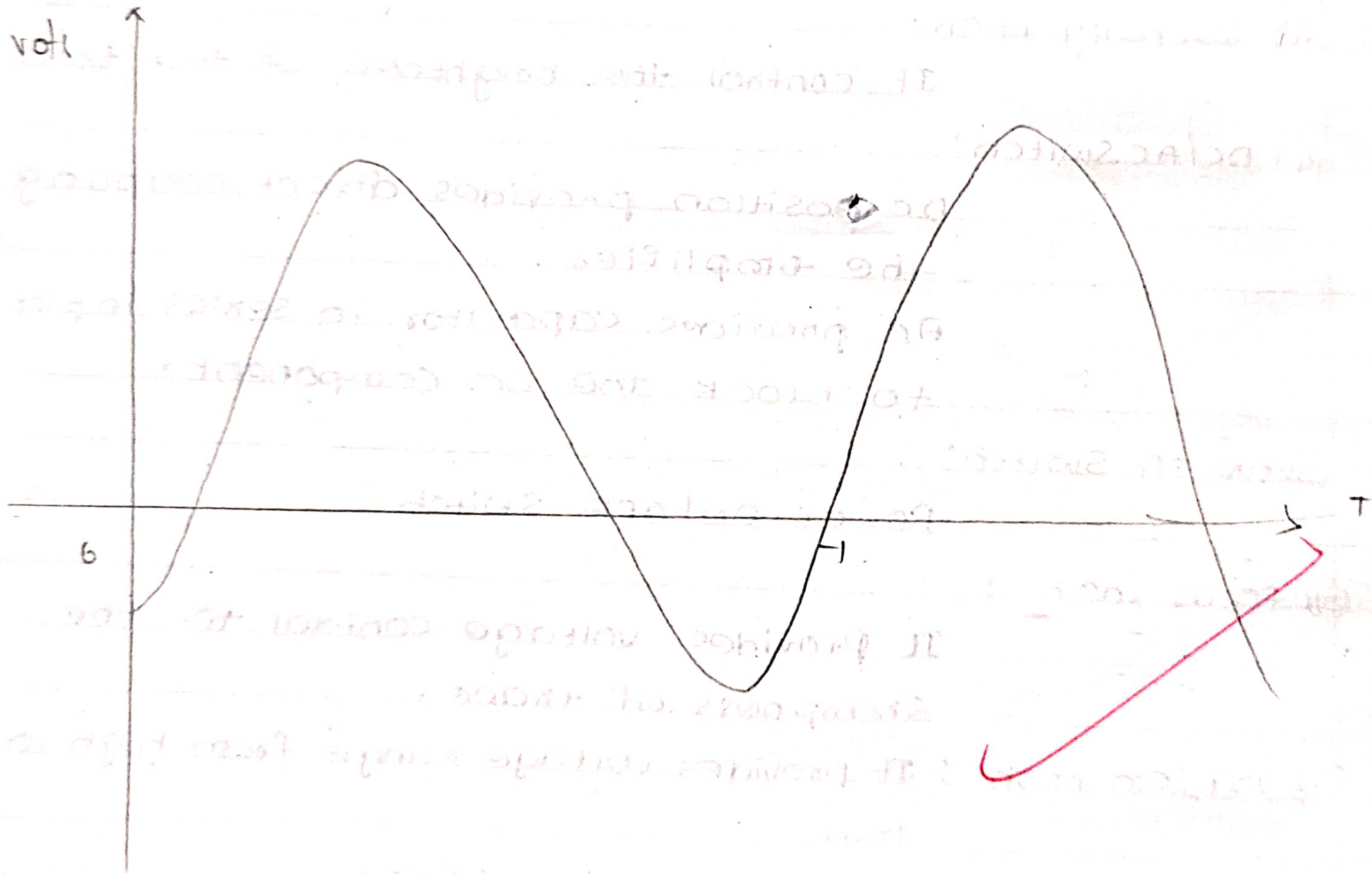
(iii) ON-OFF Switch:
Power ON/OFF Switch.

(iv) focus knob :
It provides voltage control to the sharpness of trace.

(v) volt/cm knob : It provides voltage range from high to low
It is voltage amplifier.

(vi) Time/cm : It is time base adjustment
It is time multiplier.

S.NO	Time period (T)	frequency [f = 1/T]	Peak to peak voltage	Amplitude (or) voltage
1.	3×2.0s	327 Hz	5×2V	2.5×2V



(vii) Horizontal position knob:-

It moves the horizontal on the CRT (X-axis).

(viii) vertical position knob:

It moves the trace vertically (Y-axis)

Procedure:-

Measurement of voltage and frequency:

1. Apply a sinusoidal wave to input terminal of CRO
2. put AC/DC switch in AC position
3. Adjust volts/cm knob and time to readable display
4. By adjusting the voltage for sinusoidal signal and note the peak to peak voltage as 2V.
5. By adjusting the time knob note the frequency to the fixed voltage.
6. Tabulate the readings.

Result:-

parameters of given AC signal are calculating by using CRO.

Expt. No. 3
Date : 13-9-19

VERIFICATION OF FLIP FLOPS

Aim:-

To design a combinational circuit, to implement and verify the JK and SR FLIP FLOPS.

Apparatus Required:-

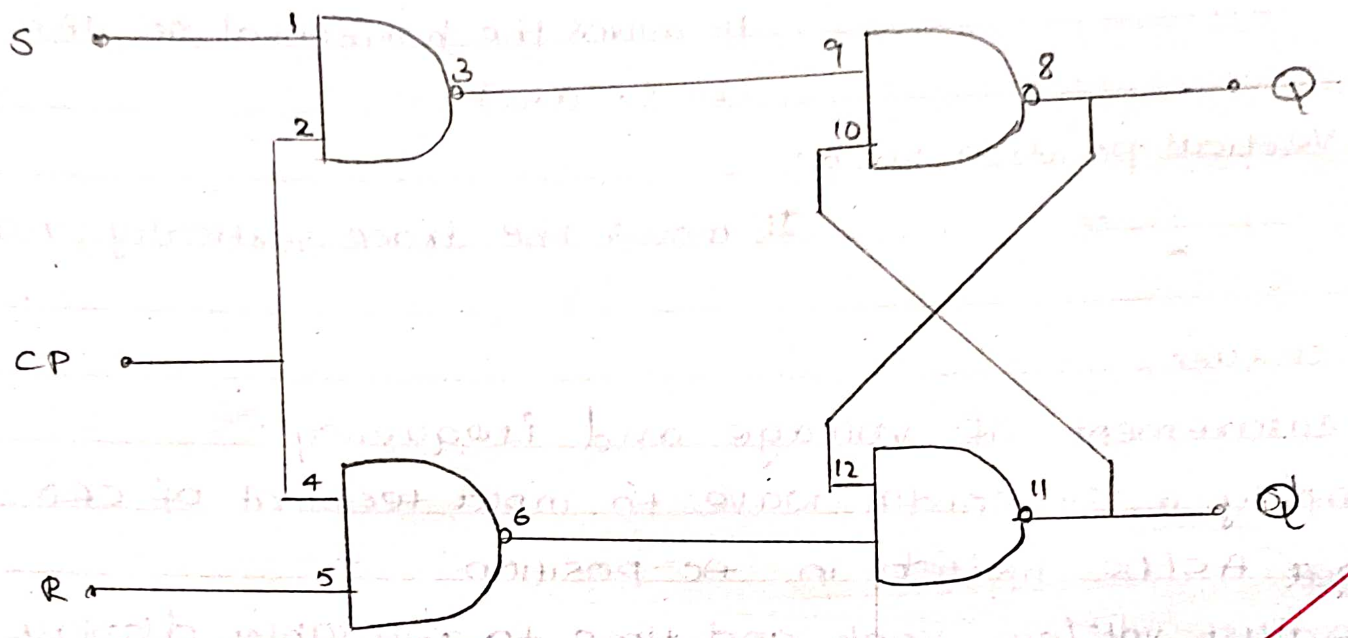
S.NO	Name of Apparatus	Range	Quantity
1.	Digital IC train kit		1
	connecting wires		As required

Theory

RS Flip Flop! The clocked RS flip flop consists of NAND gates and the output changes its state with respect to the input on application of clock pulse. When the clock pulse is high the S and R inputs reach the second level NAND gates in their complementary form. The flip flop is reset when the R inputs are high the output is in an indeterminate state.

JK Flip Flop : The indeterminate state in the SR flip-flop is defined in the JK flip flop. JK inputs behave like S and R inputs to set and reset the flip flop. The output Q is Anded with K input and the clock pulse, similarly the output Q is Anded with J input and the clock pulse. When the clock pulse is zero both the AND gates are disabled and the Q and Q' output retain their previous values. When the clock pulse is high, the J and K inputs reach the NOR gates. When the both inputs are high the output

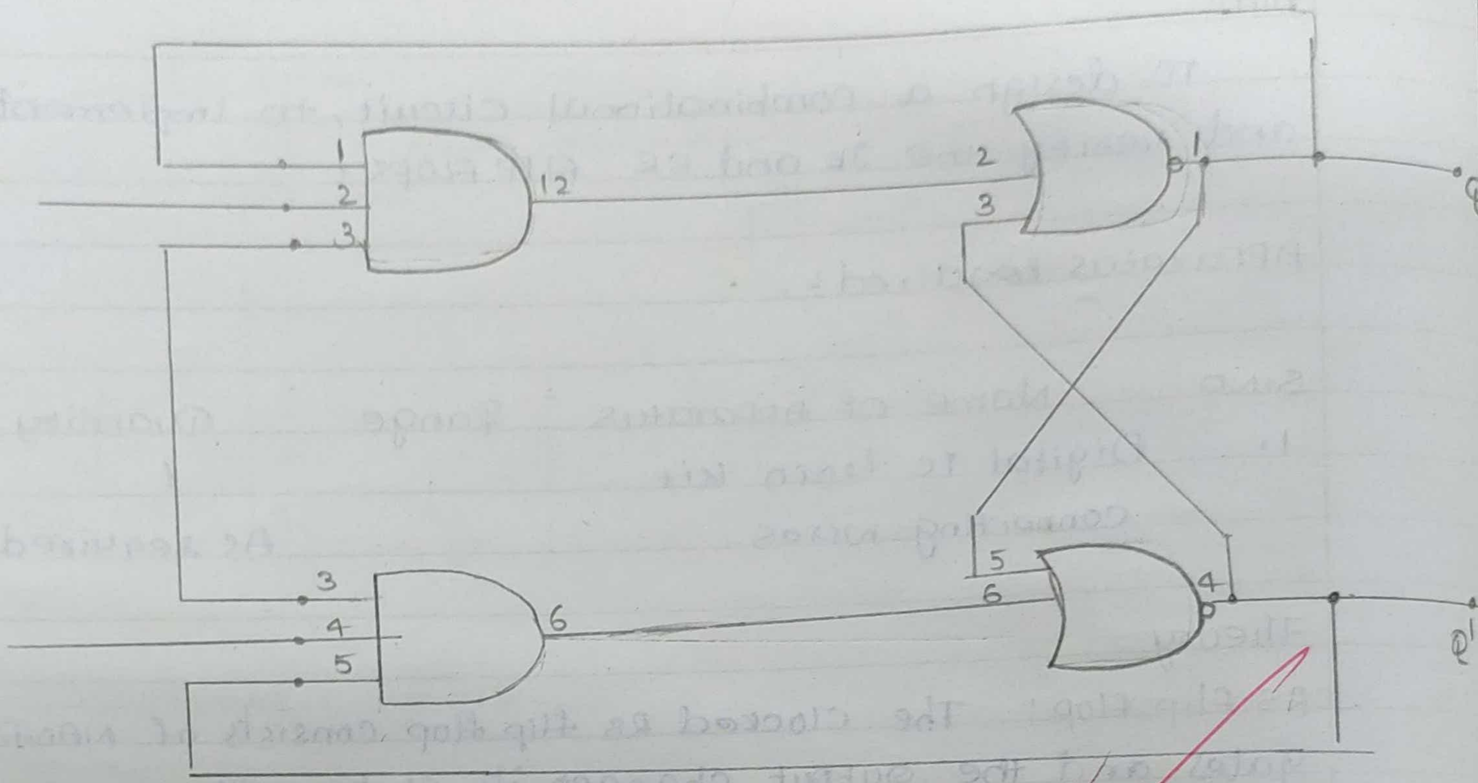
a) RS FLIP-FlOP



CHARACTERSTIC TABLE :

S.NO	INPUT		Q'	Q
	S	R		
1	0	0	0	0
2	0	0	1	1
3	0	1	0	0
4	0	1	1	0
5	1	0	0	1
6	1	0	1	1
7	1	1	0	X
8	1	1		X

b) JK FLIPFLOP :



CHARACTERSTIC TABLE :

S.NO	INPUT		Q'	Q
	J	K		
1	0	0	0	0
2	0	0	1	1
3	0	1	0	0
4	0	1	1	0
5	1	0	0	1
6		0	1	1
7		1	0	1
8		1	1	0

ate :

toggles continuously. This is called Race around condition and this must be avoided.

Procedure:

a) Flip-Flops:

1. Connections are given as per the circuit diagrams.
2. For all the ICs 7^{th} pin is grounded and 14^{th} pins is given +5V supply.
3. Apply the inputs and observe the status of all flip flops.

Result:- A circuit was designed to implement the flip-flop and the output was verified

VERIFICATION OF HALF WAVE AND FULL WAVE RECTIFIERS

HALF WAVE RECTIFIER

Objective:

1. To plot input and output waveforms of the Half-wave Rectifier.

Apparatus:

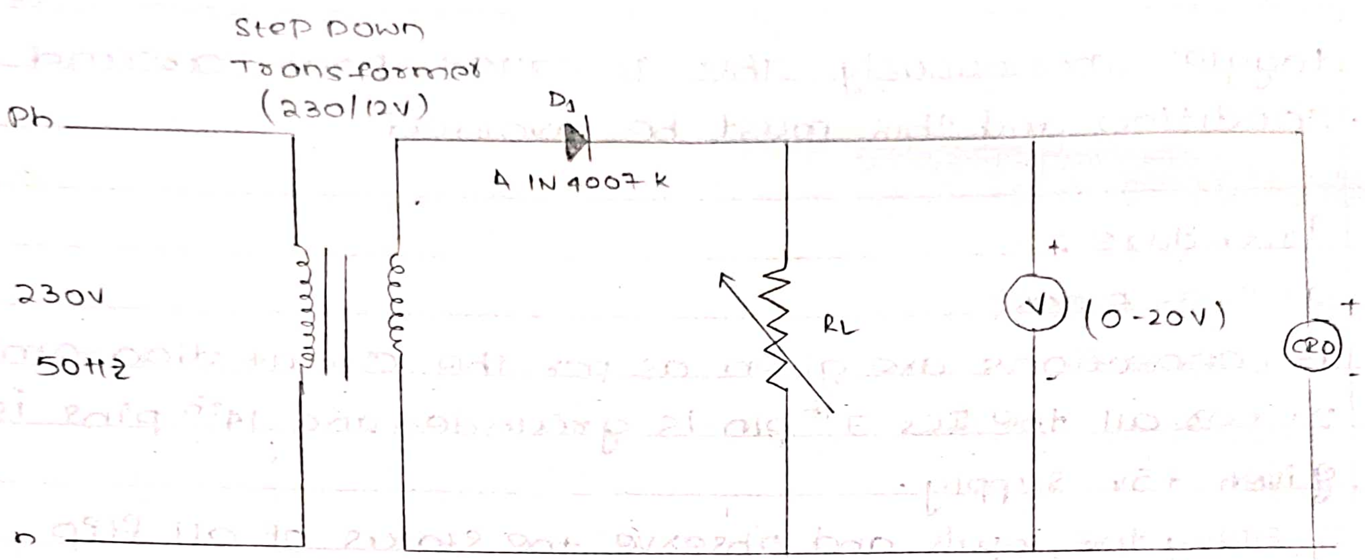
S.No	Apparatus	Type	Range	Quantity
1	Transformer	Step-down	0-12V	01
2.	Diode	IN4007		01
3.	Resistor		10-1kΩ	01
4.	Digital Multimeter (DMM)		(0-20V)	01
5.	CRO & CRO Probes			01
6.	Bread board & Wires			01

Precautions:

1. The primary and secondary sides of the transformer should be carefully identified.
2. The polarities of the diode should be carefully identified.

Procedure:

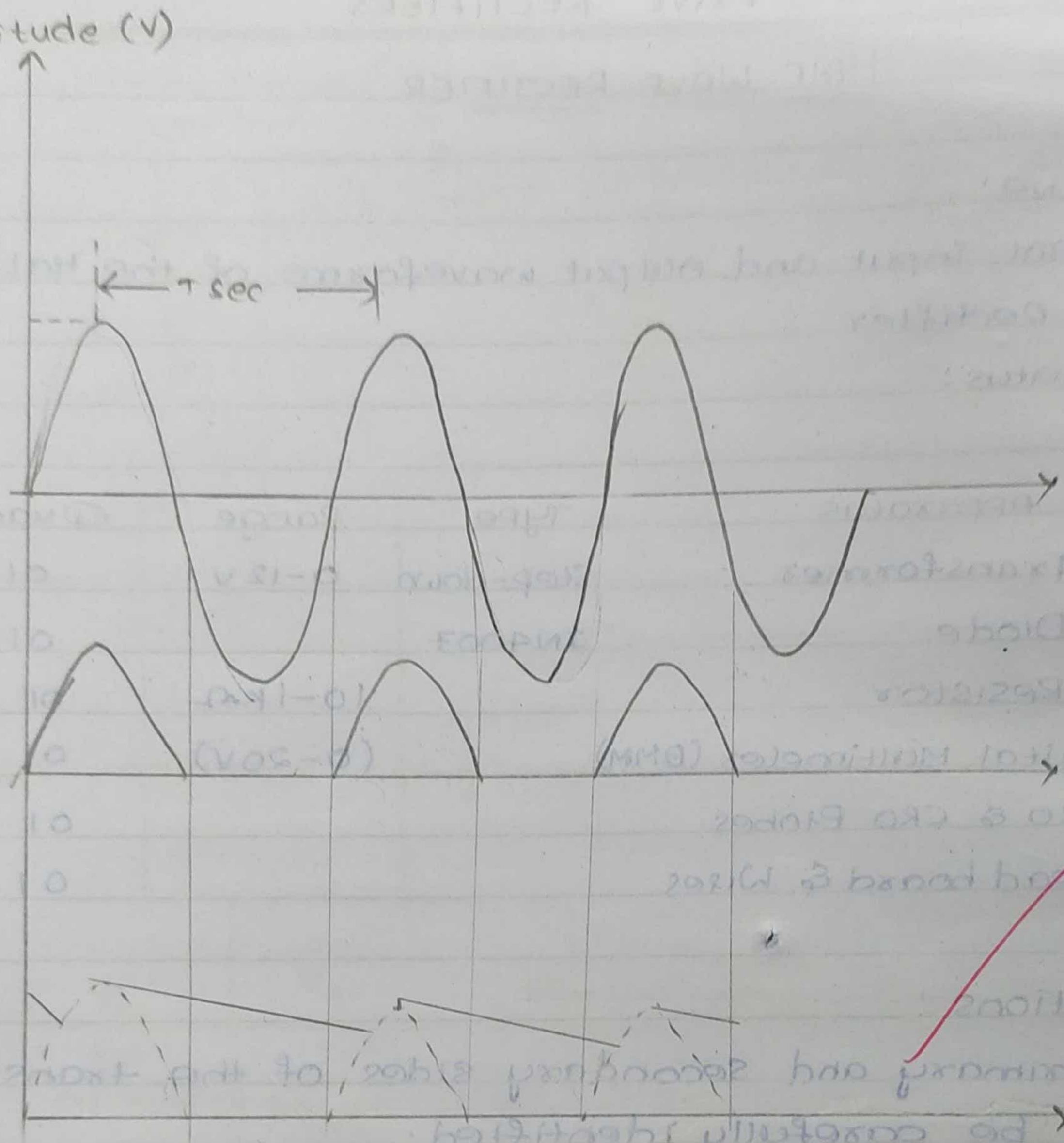
1. Connections are made as per the circuit diagram of the rectifier without filter.
2. Connect the primary side of the transformer to ac mains and the secondary side to the rectifier input.
3. Note down the no load voltage before applying the load to the circuit using the Multimeter, measure



Tabular column : using DMM

V_{ac}	V_{dc}	Ripple factor (γ) = V_{ac}/V_{dc}
i/p	4×5ms	6×5V
o/p MWR	2×5ms	3×5V
o/p SWR	2×5ms	3×5V

OUTPUT WAVEFORMS :



the ac input voltage of the rectifier and its frequency

4. Now vary the R_L in steps of 100Ω by varying the DRB from 1100Ω to 100Ω and note down the load voltage (V_L) using the multimeter of each value of R_L and calculate the percentage regulation.

5. Measure the AC and DC voltage at the output of the rectifier for each value of R_L using Multimeter

6. Now observe the output waveform on CRO across R_L and find out value of V_m.

7. Now calculate V_{dc}, V_{rms} Ripple factor and other parameters of half wave rectifier according to the given formulae.

8. Measure the amplitude and timeperiod of the transformer secondary (input wave form) by connecting CRO.

9. Feed the rectified output voltage to the CRO and measure the time period and amplitude of the waveform.

FULL WAVE RECTIFIER

objective:

1. to plot input and output wave-forms of the full wave rectifier with and without filter.
2. To find ripple factor for full wave Rectifier with and without filter.
3. To find regulation for full wave Rectifier with and without filter

Apparatus:

S.NO	Apparatus	Type	Range	Quantity
	Transformer	center tapped	12-0-12 V	01
	Diode			02
	Resistance		1kΩ	01
	Multimeter		(0-20V)	01
	CRO			01
	Bread board and wires			01

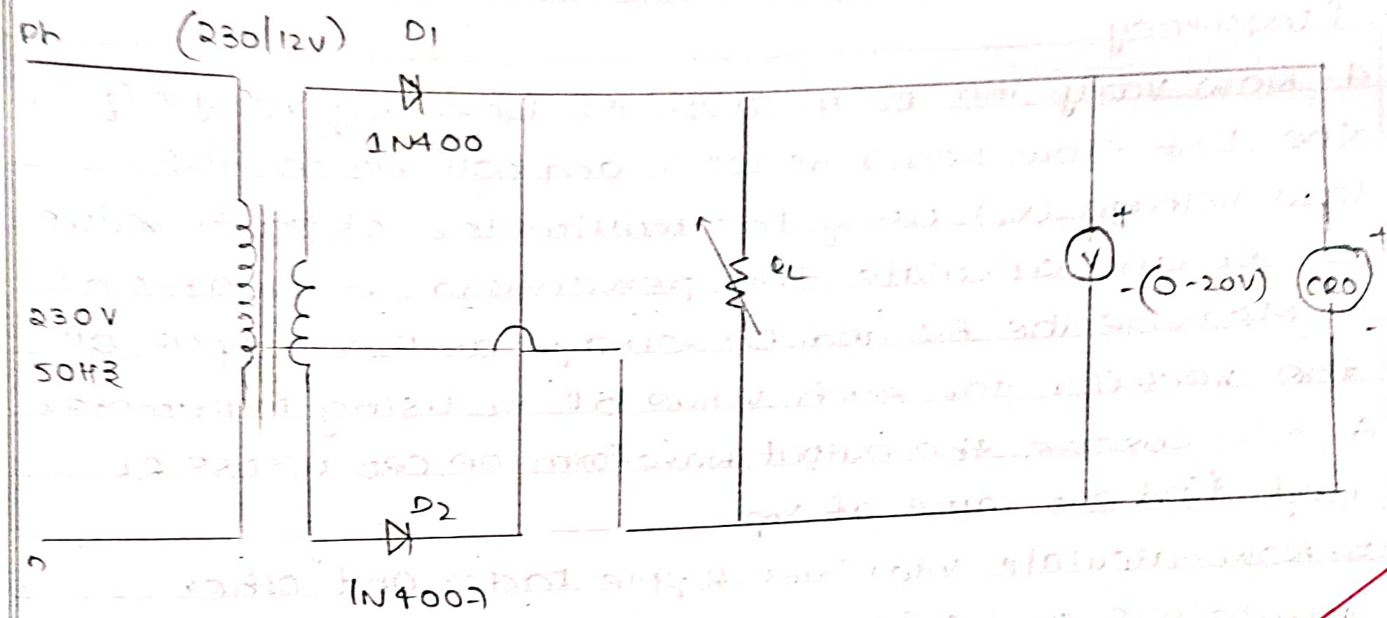
Precautions:

1. the primary and secondary sides of transformer should be carefully identified.
2. the polarities of the diode should be carefully identified.

Procedure:

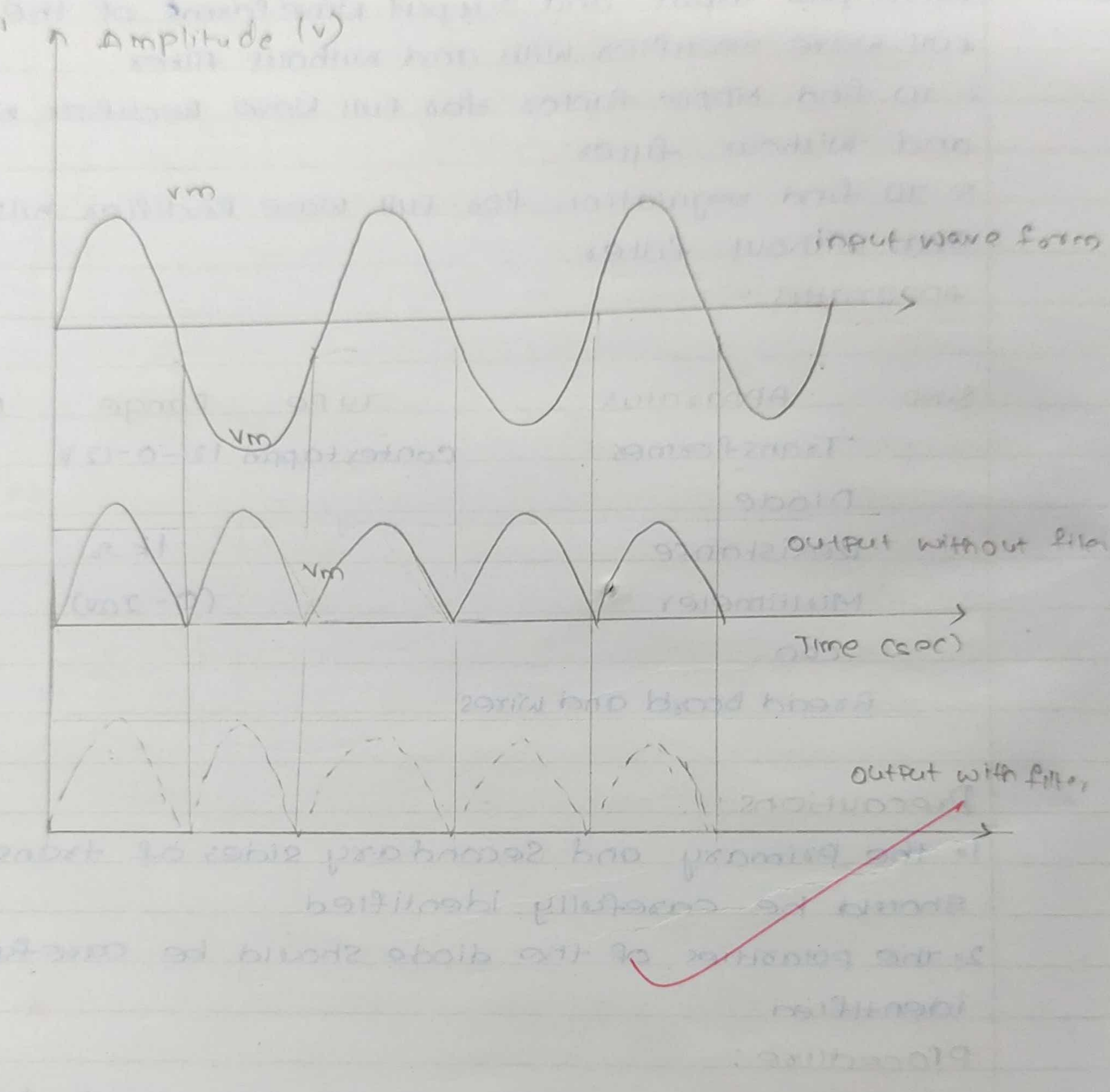
1. connections are made as per the circuit diagram of the rectifier without filter.
2. connect the primary side of the transformer to ac mains and secondary side to the rectifier input.

CIRCUIT diagram



Tabular column:

Wave form Signal	Time	Amplitude
Vin	2x10ms = 20ms	2x20V = 40V
Vout	1x10ms = 20ms	2x10V = 20V
V wt PWE	10ms	20V



Amplitude (v)
vm
input wave form
vm
output without filter
vm
Time (sec)
output with filter

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3. By the multimeter measure the ac input voltage of the rectifier and, ac and dc voltage at the output of the rectifier.

4. Measure the amplitude and time period of the transformer secondary (input waveform) by connecting CRO.

5. Feed the rectified output voltage to the CRO and measure the time period and amplitude of the wave form.

Result: the input and output wave forms of full wave rectifier is plotted.

Expl. No. 5
Date : 18/10/19

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APPLICATIONS OF OP-AMP

Aim :- To demonstrate the use of op-amp as.
1. Summing amplifier 2. Subtractor 3. Integrator
4. Differiator

Apparatus required :-

Sl. No	Apparatus	Type	Range	Quantity
1.	Op-Amp	UA 741		1
2.	Resistors		10K/1K	1
3.	Signal Generator			1
4.	CRO			1
5.	Dual power supply			1
6.	Bread Board			1
7.	Connecting wires			1

Theory :-

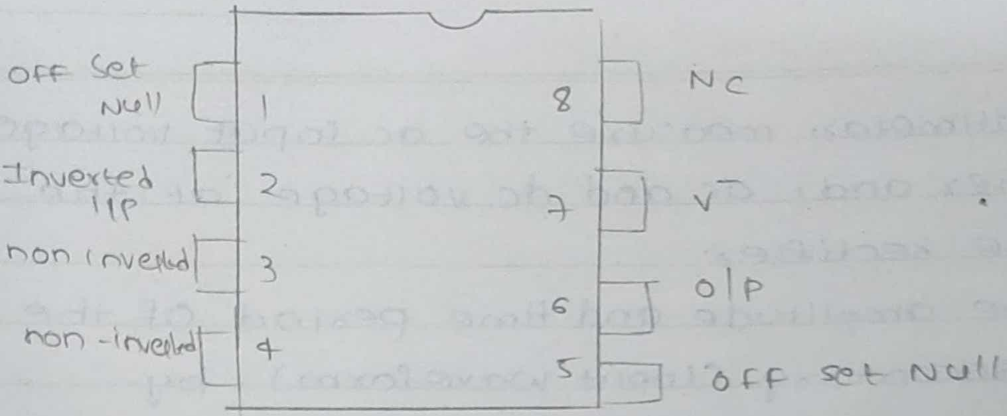
Summing Amplifier :- op-amp may be used to perform summing operation of several input signals in inverting and non-inserting mode. the input signals to be summed up are giving to inverting terminal or non-inverting terminal through the input resistance to perform inverting and non-inverting summing operations respectively

Procedure :-

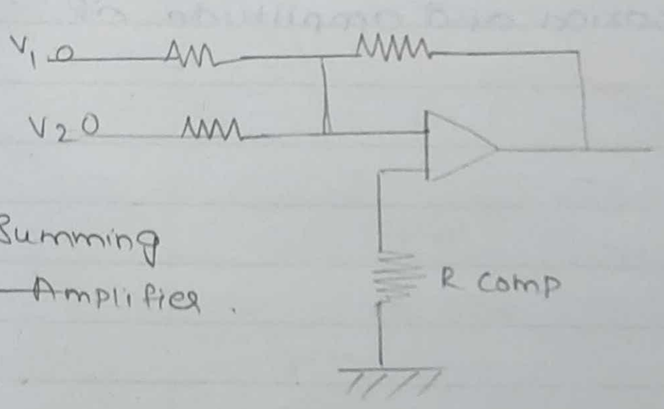
a) Inverting - summing amplifier :-

1. Connect the circuit as shown in figure.

PIN DIAGRAM

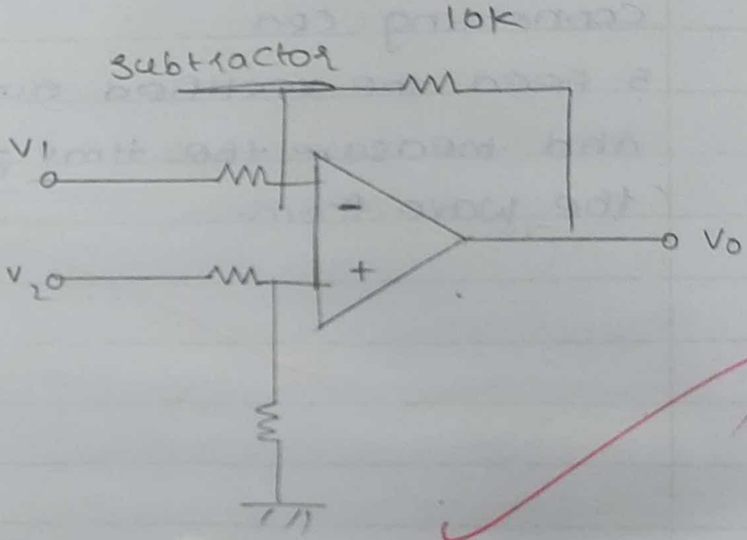


Circuit diagram :



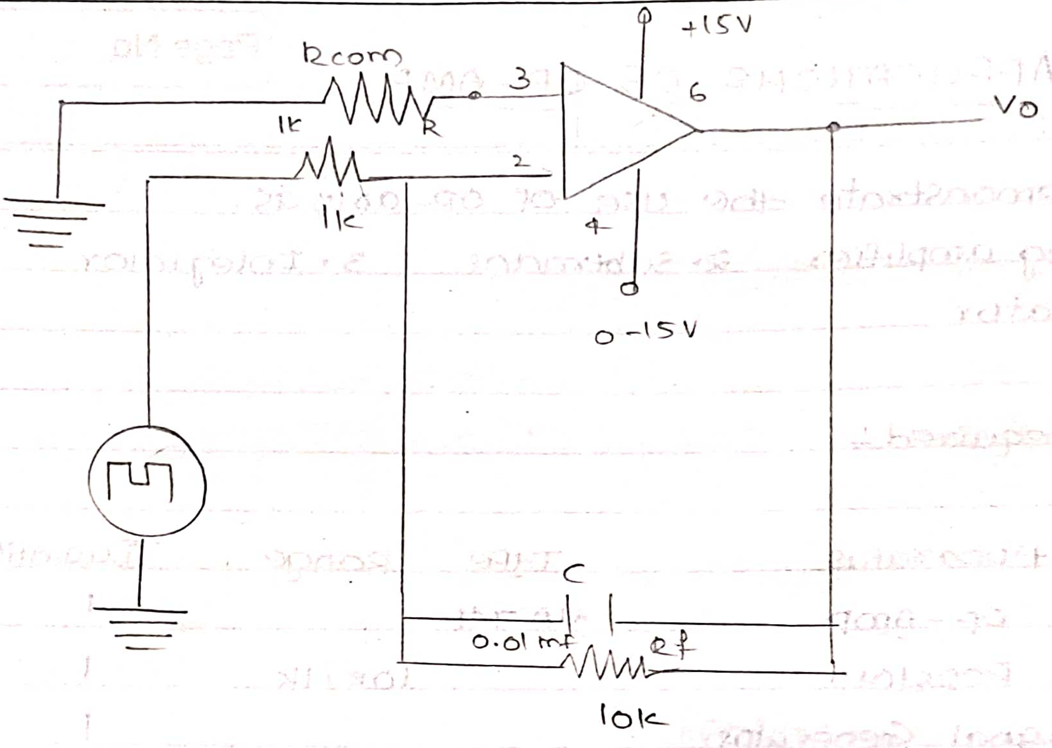
Summing Amplifier .

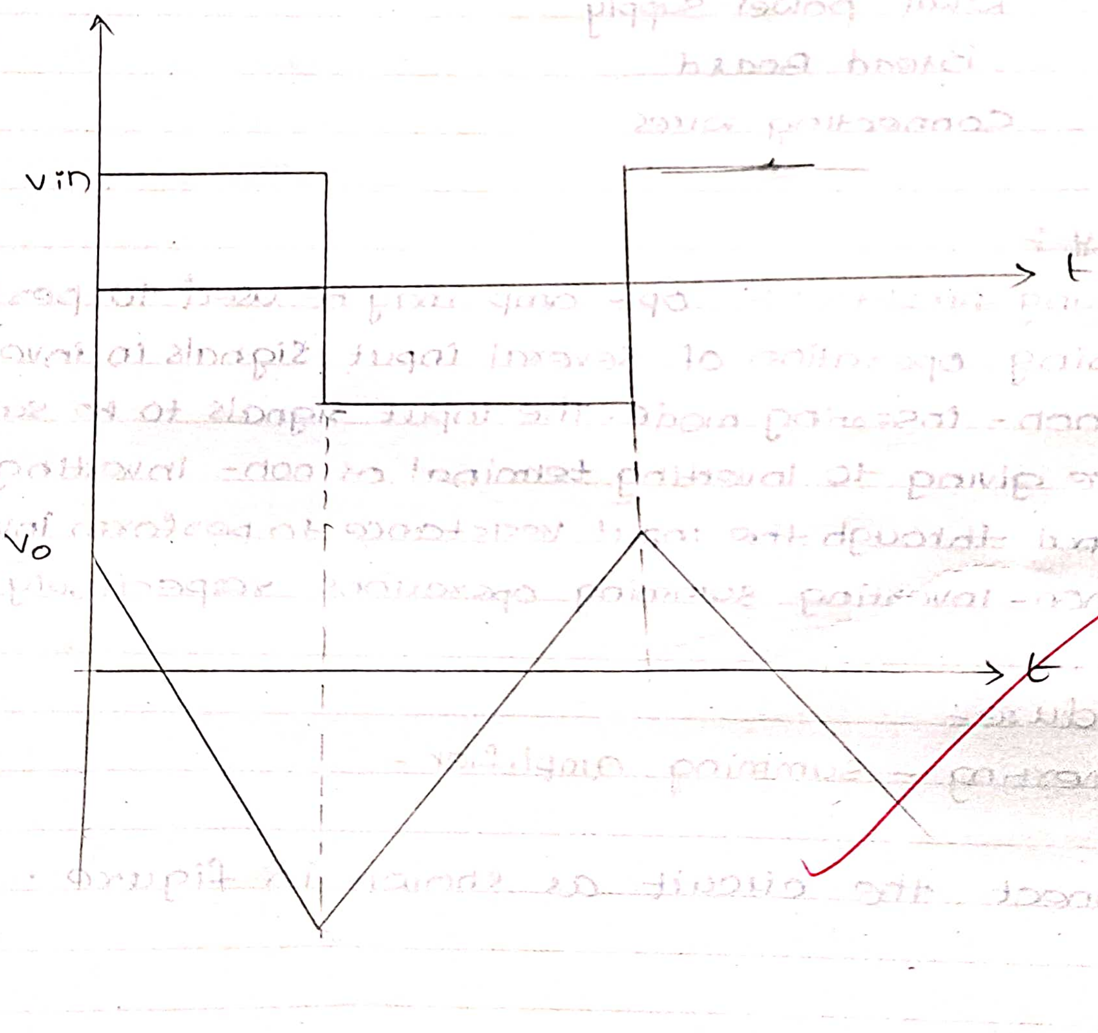
subtractor



S.I NO	V1	V2	Theoritical $V_0 = V_1 - V_2$	Practical Vo
1	5	34	8.4	8.5
2	1Q	10	20	21.8

S.I NO	V1	V2	Theoritical $V_0 = V_1 + V_2$	Practical Vo
1	10	7	3	3.003
2	10	12	-2	-2.01


+15V
Rcom
3
6
Vo
1k
R
2
1k
4
0 -15V
C
0.01 mf
Rf
10k


Vin
t
Vo
t

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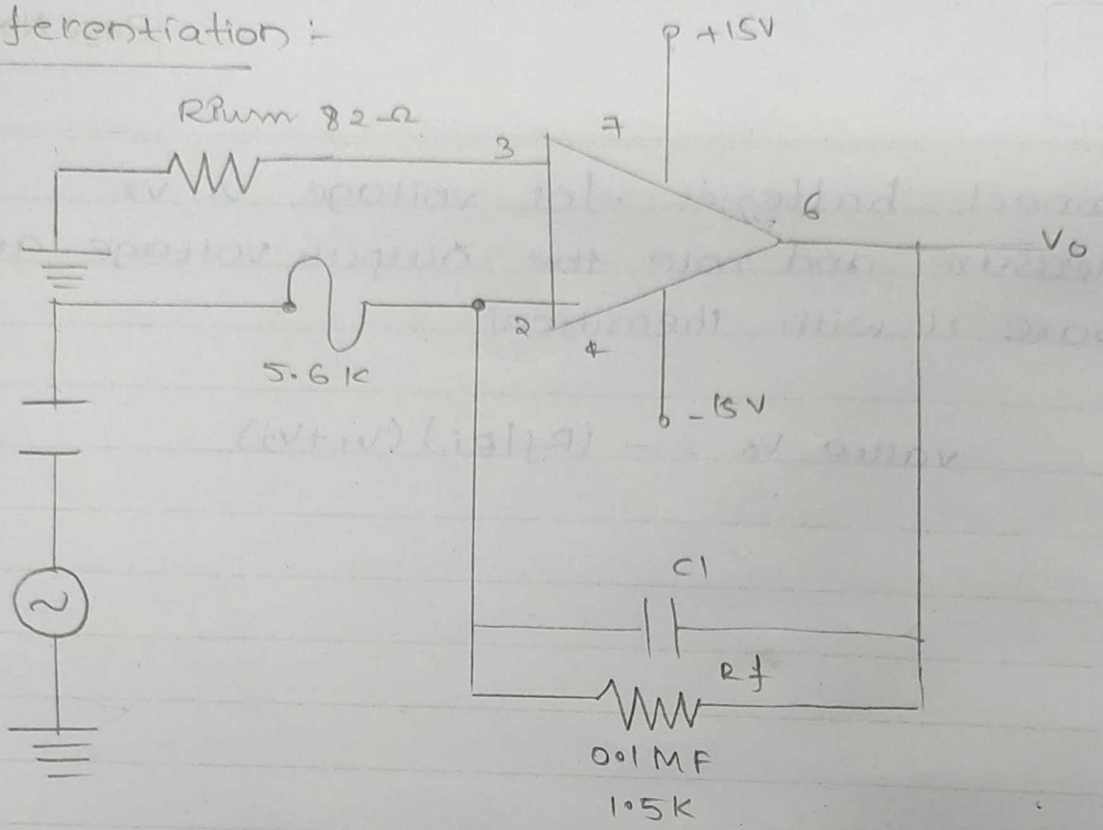
Date :

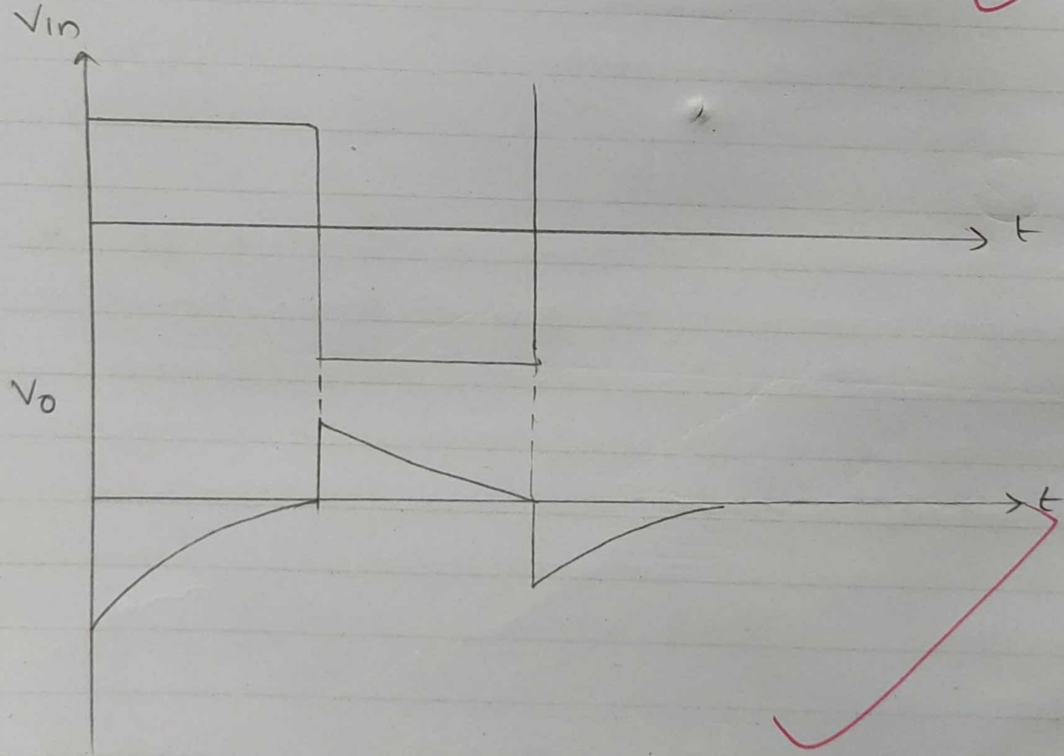
2) connect batteries for voltage V_1, V_2

3) Measure and note the output voltage and compare it with theoritical

value $V_0 = -(R_f/R_i)(V_1+V_2)$.

Differentiation :-





Expt. No.
Date :

Result :-

Thus, the use of op-amp as summing amplifier, subtractor, voltage comparator, zero crossing detector, integrator, differentiator was studied

Expt. No. 6
Date : 8-11-19

CHARACTERSTICS OF BJT in CB CONFIGRATION

Aim: To study and plot the transistor characterstics in CB configuration.

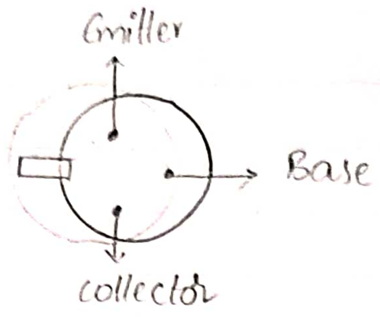
Apparatus required:

S.I NO	Name	Range	Quantity
1.	RPS	(0-30) V	2
2.	Transistor	BC-107	1
3.	resistor	10, 1K-Ω	1
4.	Bread Board	(-)	1
5.	Ammeter	(0-10) mA (0-1)A	1, 1
6.	voltmeter	(0-30) V, (0-2) V	1, 1

Theory:-

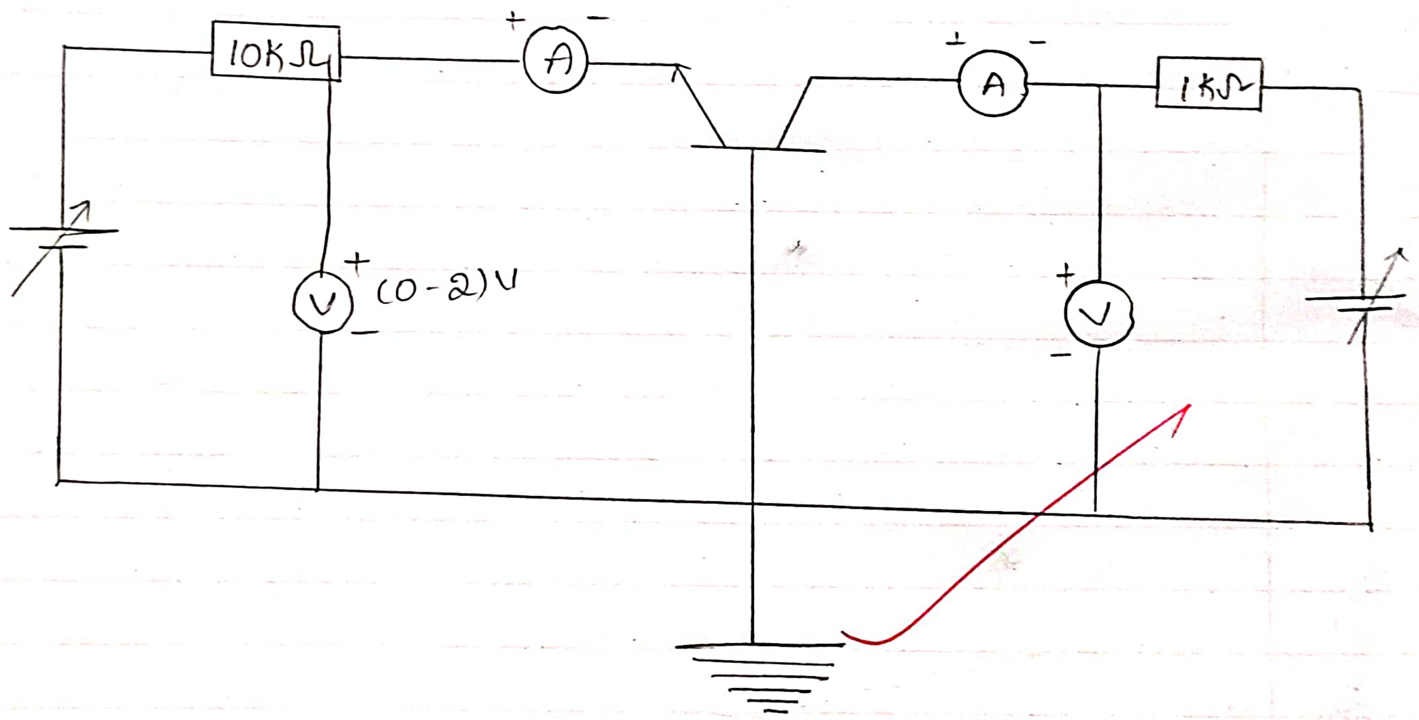
In this configuration the base is made common to both the input and out. the emitter is given the input and output is taken across the collector. the current gain of this configuration is less than unity. The voltage gain of CB configuration is high. Due to the high voltage gain, the power gain also high. Due to the high. In CB configuration the input characterstic relate IE and VEB for a constant VCB. Initially let VCB = 0 then the input junction is equivalent to a forward biased diode and the characterstics resembles that of a diode where VCB = +V1 (volts) due to early effect IE increases and so the characteristics shift to the left. the output characterstics relate IC and VCB

Pin diagram



Speciation:- BC 107 /50 V/0.1A , 0.3W, 300 MHz.

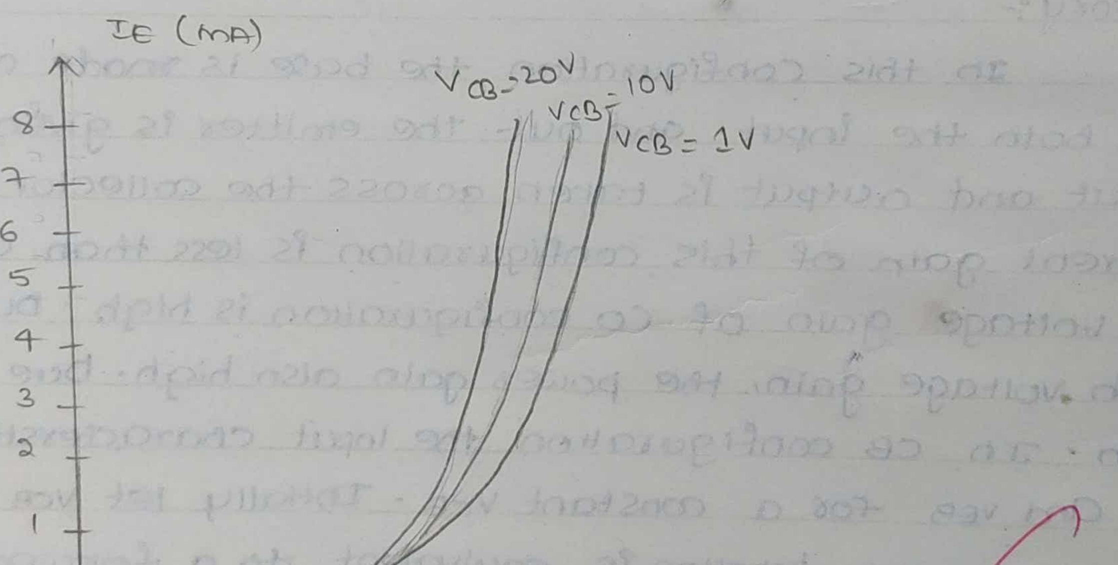
Circuit Diagram:-



Tabular form:- Input characterstics

S.no	V_{CB} = V		V_{CB} = V		V_{CB} = V	
	V_{EB} (V)	I_E (mA)	V_{EB} (V)	I_E (mA)	V_{CEB} (V)	I_C (mA)
1.	0.1	0	0.2	0	0.2	0
2.	0.3	0	0.3	0	0.3	0
3.	0.4	0	0.4	0	0.4	0
4.	0.5	0	0.5	0	0.5	0
5.	0.6	0.2	0.6	0.2	0.6	0.1

Model Graph Input Characterstics



for a constant. Ic Initially Ic increases and then it leaves for a value. $I_C = \alpha I_E$ when I_E is increased I_C also increased Ic also increases proportionality. though increase in V_{CB} causes an increase in α, since α is a fraction it is negligable and so I_C remain a constant for all values of V_{CB} once it leaves off.

Procedure:

Input characteristics:-

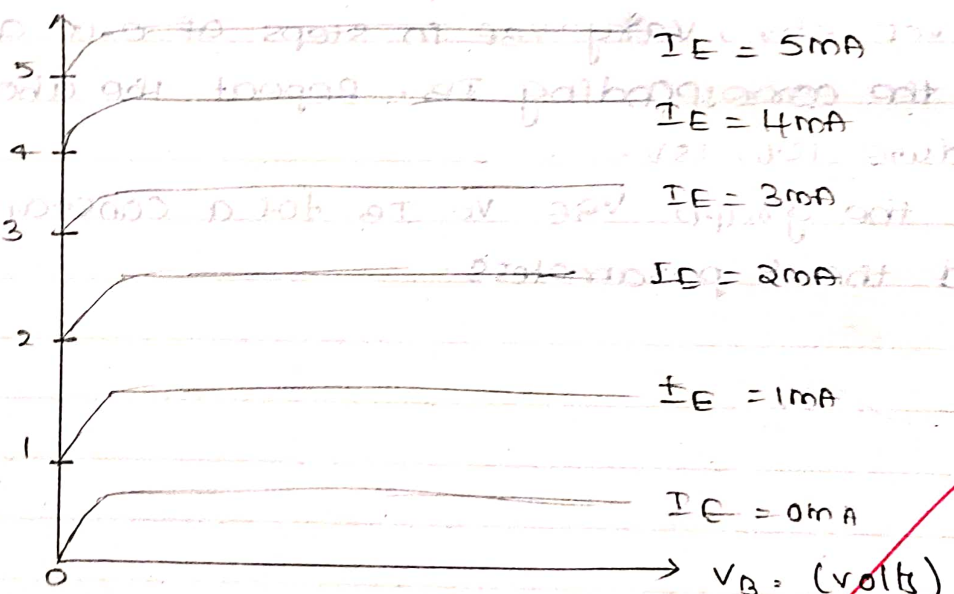
It is the curve between emitter current I_E and emitter-base voltage V_{BE} at constant collector base voltage V_{CB}

1) connect the circuit as per the circuit diagram
2. set V_{CE} = 5V, vary V_{BE} in steps of 0.1V and note down the corresponding I_B. Repeat the above procedure 10V, 15V.
3. plot the graph V_{BE} vs I_B for a constant V_{CE}.
4. find the h parameters.

output characteristic

S.no	I_E = mA		I_E = mA		I_E = mA	
	V_{CB} (V)	I_C (mA)	V_{CB} (V)	I_C (mA)	V_{CB} (V)	I_C (mA)
1.	0	0	0	0	0	0
2.	0.2	4.9	0.2	3.9	0.2	2.9
3.	0.4	5	0.4	4	0.4	3
4.	0.6	5	0.6	4	0.c	3
5.	0.8	5	0.8	4	0.8	3
6.	1.0	5	1.0	4	1.0	3

Model Graph : output - Characteristics



Collector - Base voltage

Output characteristics :-

It is the curve between collector current Ic and collector-base voltage VCB at constant emitter current IC.

1) connect the circuit as per the circuit diagram
2. set IB = 20uA, vary VCE in steps of 1V and note down the corresponding Ic. Repeat the above procedure for 40uA, 80uA, etc.
3. plot the graph VCE vs IC for a constant IB
4. find the 'h' parameter.

Result:

The transistor characteristics of a common Base configuration were plotted and studied.

Completed

16/11/19