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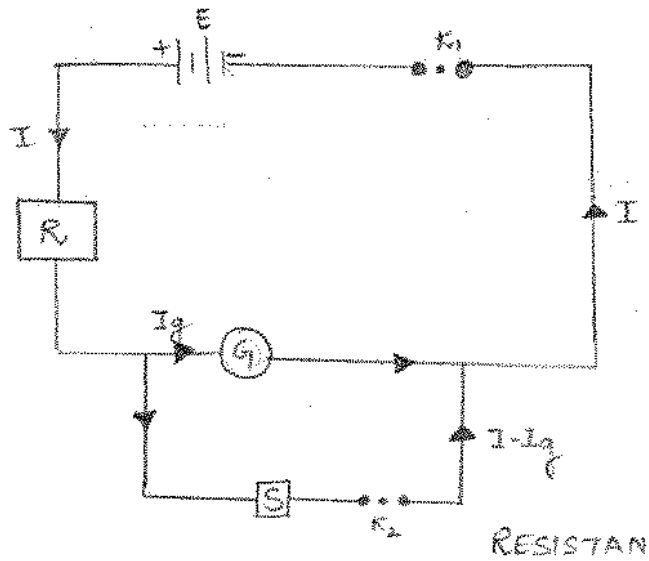


RESISTANCE OF GALVANOMETER

OBSERVATION

S.NO	RESISTANCE(R) Ω	Deflection in G (θ)	Shut Resistance (S) Ω	Half Deflection (θ/2)	$G = \frac{RS}{R-S}$
1.	7000	22	47	11	47.2 Ω
2.	6200	26	47	13	47.2 Ω
3.	9000	18	47	9	47.2 Ω
4.	10000	16	47	8	47.2 Ω
5.	8000	20	47	10	47.2 Ω

CALCULATION

$$G = \frac{G_1 + G_2 + G_3 + G_4 + G_5}{5}$$

$$G = \frac{5 \times 47.2}{5} \Omega$$

$$G = 47.2 \Omega$$

Date 8/04/13

Expt. No. 1 Page No. 1

TO DETERMINE RESISTANCE OF A GALVANOMETER BY HALF DEFLECTION METHOD

AIM: To determine resistance of a galvanometer by half deflection method

APPARATUS: A weston type galvanometer, a volt meter, battery, resistance boxes (10,000 Ω and 200 Ω), keys, rheostat, metre scale, ammeter, wires, sand paper.

THEORY: The resistance of the given galvanometer is given by

$$G = \frac{R.S}{R-S}$$

(R = resistance in series)
(S = shunt resistance)

RESULT: Resistance of the given Galvanometer = 47.2 Ω.

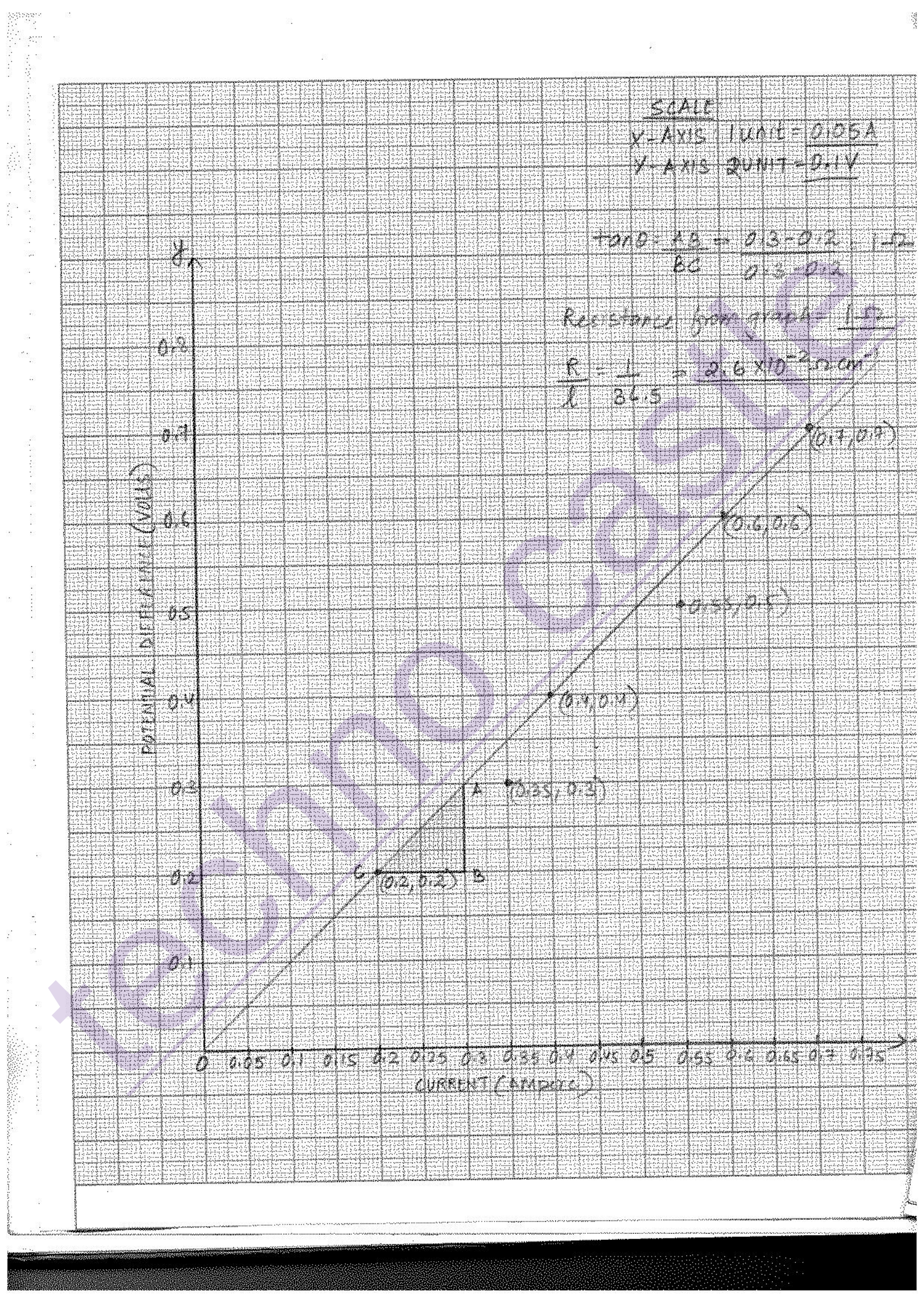
PRECAUTIONS:

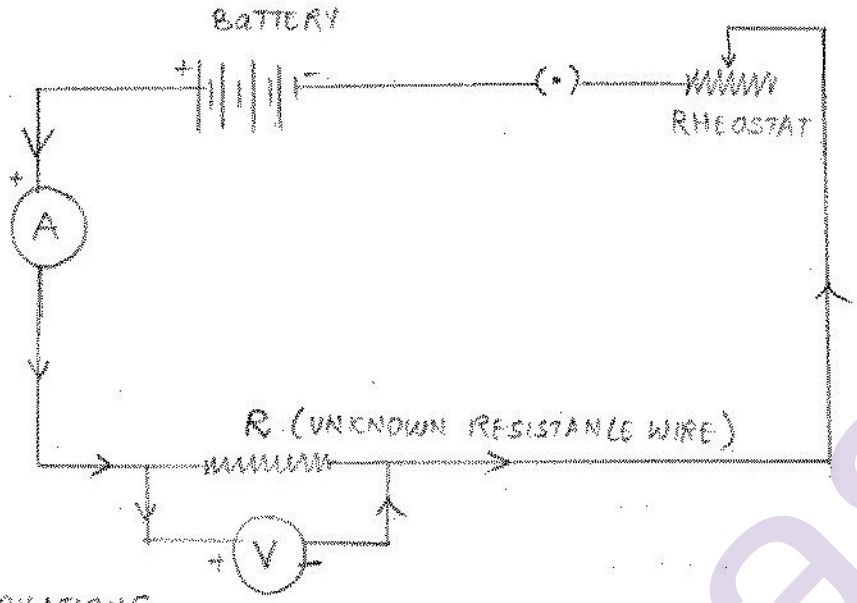
1. All connections should be neat, clean and tight.
2. All plugs in resistance boxes must be tight.

SOURCES OF ERROR:

1. The screws of the instrument may be loose.
2. The plugs of resistance boxes may not be clean.

Teacher's Signature : _____


SCALE
X-AXIS 1 UNIT = 0.05 A
Y-AXIS 1 UNIT = 0.1 V
tan θ = AB/BC = 0.3 - 0.2 / 0.35 - 0.15 = 1/2
Resistance from graph = 1/2 Ω
R/l = 1/84.5 = 2.6 × 10^-2 Ω cm^-1
(0.1, 0.1)
(0.4, 0.4)
(0.5, 0.5)
(0.7, 0.7)
A (0.35, 0.3)
B
C (0.2, 0.2)
O
0.05 0.1 0.15 0.2 0.25 0.3 0.35 0.4 0.45 0.5 0.55 0.6 0.65 0.7 0.75
CURRENT (AMPERE)
POTENTIAL DIFFERENCE (VOLTS)
0.1 0.2 0.3 0.4 0.5 0.6 0.7



OBSERVATIONS

1) Length of wire = 36.5 cm

2) Range of Ammeter: 0-3 A Least count: 0.05A Zero error: nil

3) Range of Voltmeter: 0-5 V Least count: 0.1V Zero error: nil.

S.NO	VOLTMETER Reading	AMMETER Reading	$V/I = R\ \Omega$
1.	0.3V	0.35A	0.9 Ω
2.	0.4V	0.40A	1 Ω
3.	0.5V	0.55A	0.9 Ω
4.	0.7V	0.70A	1 Ω

$$R_{net} = \frac{R_1 + R_2 + R_3 + R_4}{4} \Rightarrow 0.95\ \Omega$$

$$\frac{R}{l} \Rightarrow \frac{0.95}{36.5} \Rightarrow 2.603 \times 10^{-2}\ \Omega\ cm^{-1}$$

Date 01/07/13

Expt. No. 02 Page No. 02

TO DETERMINE RESISTANCE PER UNIT LENGTH OF A GIVEN WIRE USING OHM'S LAW

AIM: To determine resistance per cm of a given wire by plotting a graph of potential difference versus current.

REQUIREMENTS: A resistance wire, a voltmeter, ammeter, battery, rheostat, meter scale, connecting wires and key.

THEORY: According to ohm's law

$V \propto I$

$\Rightarrow V = IR$

V = Potential difference

I = Current

R = Resistance

$$\frac{V}{I} = R$$

R depends on nature of material, temp and dimensions.

RESULT: (i) Resistance per cm of the wire is $2.603 \times 10^{-2}\ \Omega\ cm^{-1}$

(ii) The graph between V and I is a straight line

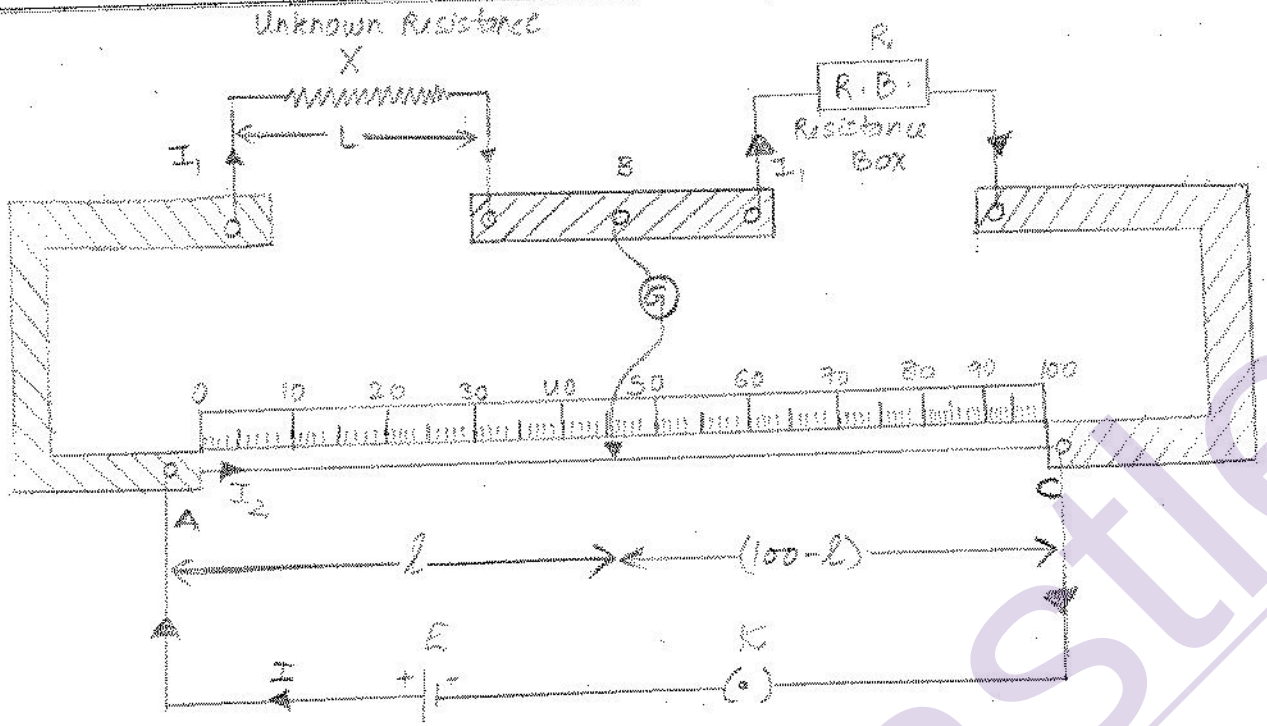
PRECAUTIONS:

1) The connections should be neat, clean and tight.
2) Voltmeter and ammeter should be of proper range.

SOURCES OF ERROR:

1) The instrument screws may be loose.
2) Rheostat may have high resistance.

Teacher's Signature : _____



OBSERVATIONS

1) Length of wire = 30 cm

2) diameter of wire = 0.025 cm Least count of screw gauge = 0.001

S.No	Resistance	l (cm)	$100 - l$ (cm)	$X = \left(\frac{l}{100-l}\right) \times R$
1.	4Ω	37.4 cm	62.6 cm	4.24 Ω
2.	5Ω	53.1 cm	46.9 cm	4.31 Ω
3.	10Ω	68.6 cm	31.4 cm	4.57 Ω

3) Mean Resistance of wire = (X) = 4.44 Ω

4) Resistivity = $\frac{X \pi D^2}{4l}$ = 7.26×10^{-7} Ωm

Date 02/07/13

Expt. No. 3 Page No. 3

METRE BRIDGE

AIM: To find resistance of a given wire using metre bridge and hence determine the specific resistance of its material.

APPARATUS: A meter bridge, Battery, (G), resistance box, jockey, resistance wire, screw guage, metre scale, connecting wires.

THEORY: Formula used

1) Unknown Resistance X is given by

$$X = \frac{l}{100 - l} \times R$$

2) Specific Resistance is given by

$$\rho = \frac{X \pi D^2}{4L}$$

RESULT: 1) The value of unknown resistance X =

2) Specific resistance of the unknown wire is =

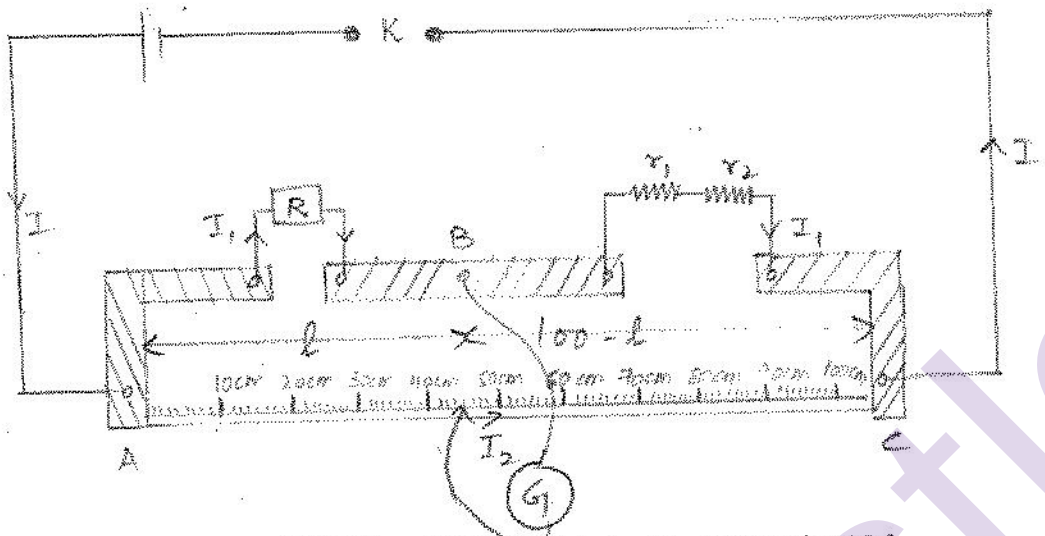
PRECAUTIONS:

1. All connections should be neat, clean and tight.
2. All the plugs in the resistance box should be tight.

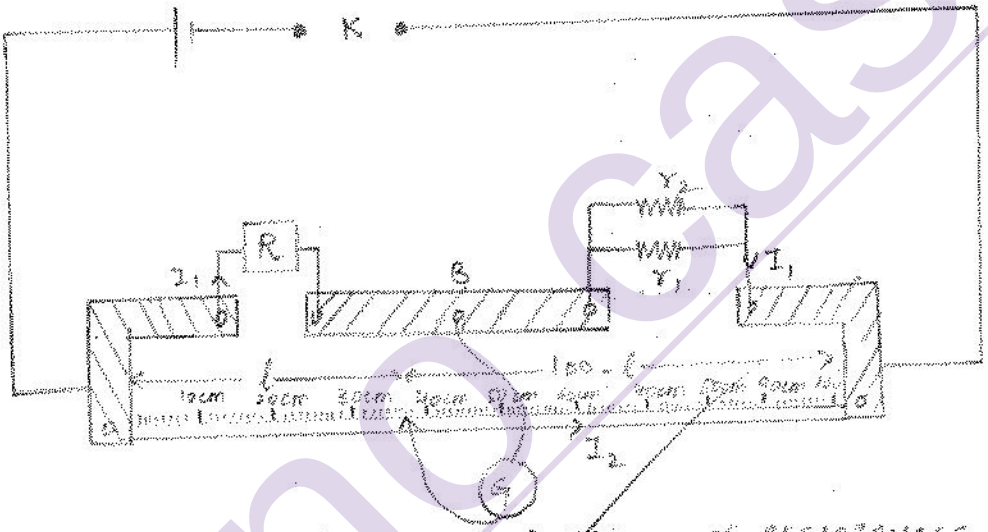
SOURCES OF ERROR:

1. The instrument screws may be loose.
2. The plugs may not be clean

Teacher's Signature :



SERIES COMBINATION OF RESISTANCES



PARALLEL COMBINATION OF RESISTANCES

RESISTANCE COIL	No. of OBS.	R Ω	l cm	(100-l) cm	$r = \frac{(100-l)R}{l}$ Ω	Exp. value: Mean resistance	Theoretical value: Mean resistance
r_1 only	1.	5 Ω	71 cm	29 cm	1.93 Ω	$r_1 = 1.98$ Ω	$r_1 = 2$ Ω
	2.	5 Ω	71.2 cm	28.8 cm	2 Ω		
	3.	5 Ω	71.6 cm	28.4 cm	1.95 Ω		
r_2 only	1.	3 Ω	35 cm	25 cm	0.9 Ω	$r_2 = 1$ Ω	$r_2 = 1$ Ω
	2.	3 Ω	26.1 cm	23.8 cm	1.1 Ω		
	3.	3 Ω	94 cm	26 cm	1 Ω		
$r_1 = r_2 = R_s$	1.	7 Ω	69 cm	31 cm	2.9 Ω	$R_s = 2.9$ Ω	$R_s = 3$ Ω
	2.	7 Ω	70 cm	30 cm	3 Ω		
	3.	7 Ω	68 cm	32 cm	3.1 Ω		
$R_p = \frac{r_1 r_2}{r_1 + r_2}$	1.	9 Ω	95 cm	7 cm	0.65 Ω	$R_p = 0.61$ Ω	$R_p = \frac{2}{3} = 0.66$ Ω
	2.	9 Ω	93.7 cm	6.3 cm	0.62 Ω		
	3.	9 Ω	91 cm	9 cm	0.59 Ω		

Date 9/7/15

Expt. No. 4

Page No. 4

METRE BRIDGE

AIM: To verify the laws of combination (series and parallel) of resistances using a metre bridge

APPARATUS: A metre bridge, battery, a (G), resistance box, jockey, resistance coils, connecting wires, sand paper.

THEORY: (i) Unknown resistance $= \left(\frac{100-l}{l}\right) \times R$

(ii) $R_s = r_1 + r_2$

(iii) $R_p = \frac{r_1 r_2}{r_1 + r_2}$

RESULT:

1) Within limits of experimental error, experimental and theoretical values of R_s are same. Hence, law of resistances in series is verified.

2) Within limits of experimental error, experimental and theoretical values of R_p are same, Hence, law of resistance in parallel is verified.

PRECAUTIONS: 1) All connections should be clean, neat and tight.

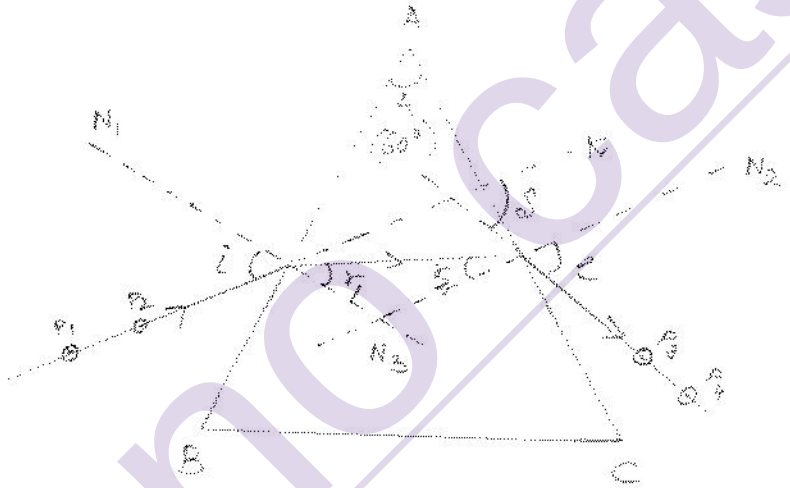
2) All the plugs in the resistance should be tight.

SOURCES OF ERROR:

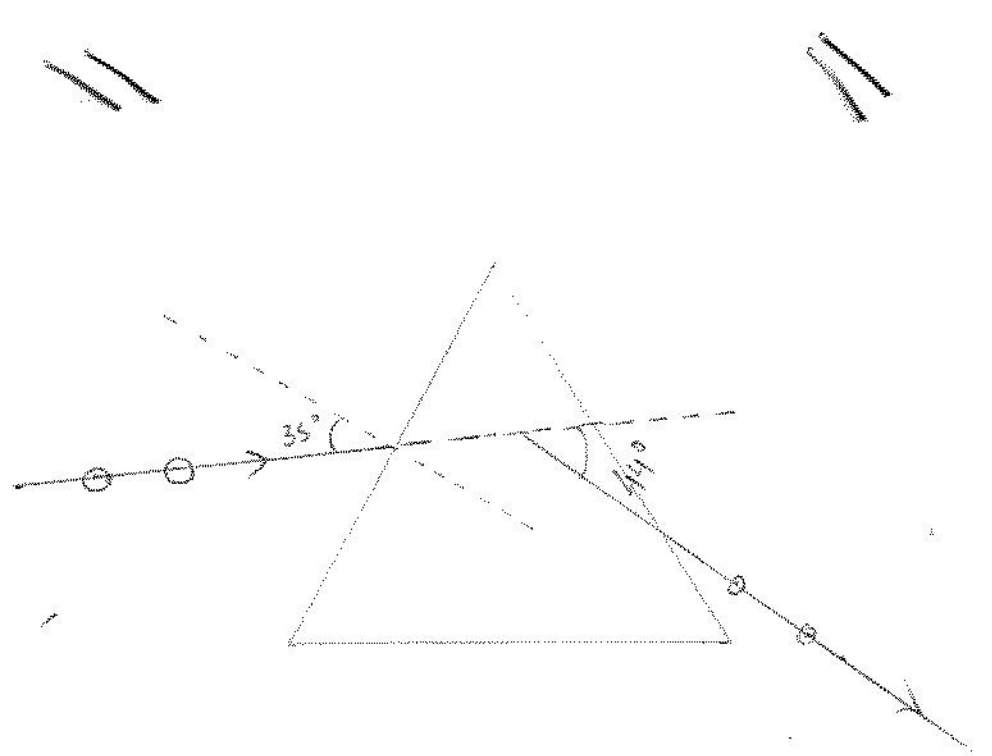
1) The instrument screws may be loose

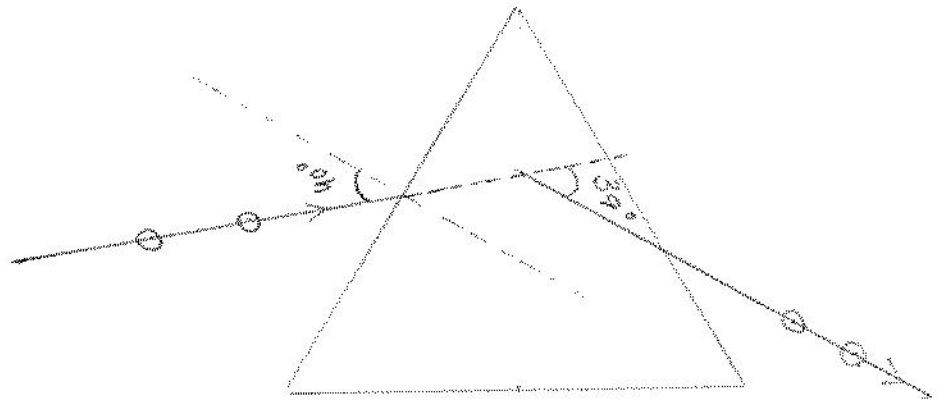
2) The plugs may not be clean.

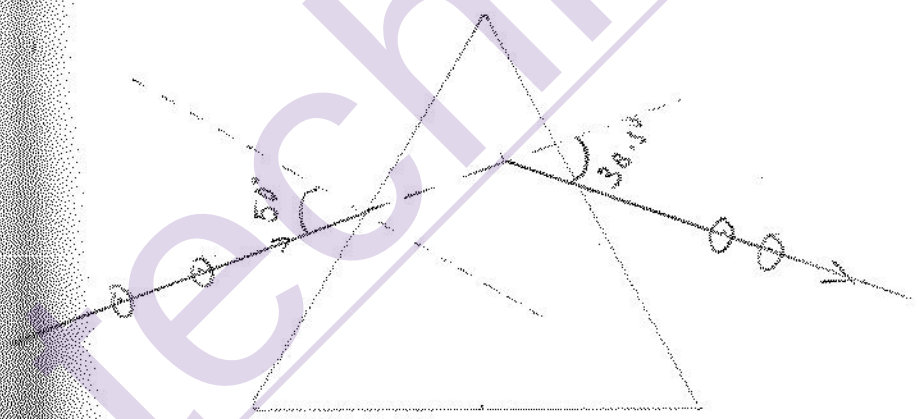
Teacher's Signature :

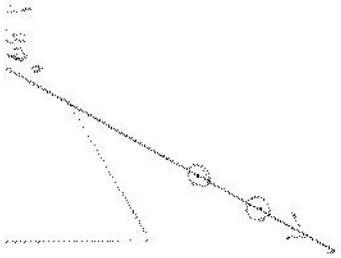


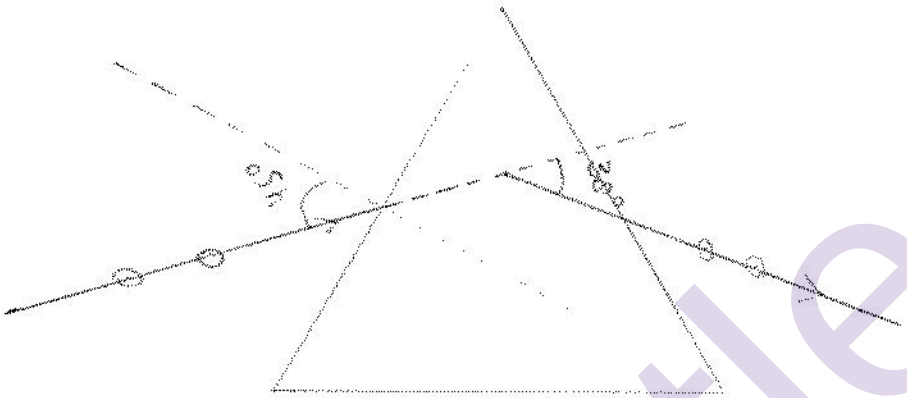
S.NO	ANGLE OF INCIDENCE (i)	ANGLE OF DEVIATION (δ)
1.	25°	44°
2.	40°	37°
3.	45°	38°
4.	42.5°	37.5° (δm)
5.	50°	45.5°
6.	55°	49°

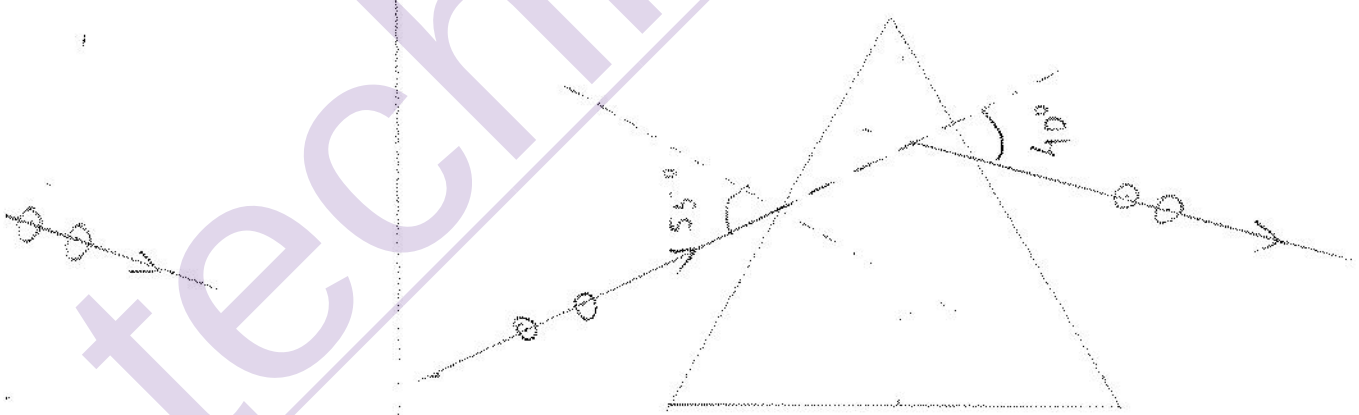












Date 16/07/13

Expt. No. 05 Page No. 05

ANGLE OF MINIMUM DEVIATION

AIM: To determine angle of minimum deviation for a given prism by plotting a graph between angle of incidence and angle of minimum deviation

APPARATUS: Drawing board, white sheet of paper, prism, drawing pins, pencil, metre scale, office pins, graph paper, protractor.

THEORY: The refractive index (μ) of a material is given by

$$\mu = \frac{\sin\left(\frac{A + S_m}{2}\right)}{\sin\left(\frac{A}{2}\right)}$$

S_m = angle of minimum deviation

A = angle of prism

RESULT:

(i) i-S graph indicates that as angle of incidence (i) increases, angle of deviation (D) first decreases, attains a minimum value (S_m) and then starts increasing for further increase in angle of incidence

(ii) angle of minimum deviation S_m = 37.5°

(iii) Refractive index of prism (μ) = 1.567

Teacher's Signature : _____

GRAPH BETWEEN i and S

Date 16/07/13

Expt. No. 05 Page No. 06

PRECAUTIONS:

1) angle of incidence lies between 35° - 60°
2) pins should be fixed vertical
3) The same angle of prism should be used for all observations

SOURCES OF ERROR

1) Pin pricks may be thick
2) measurement of angles may be wrong

Teacher's Signature : _____

SERIAL NO	READING ON VERTICAL SCALE WHEN MICROSCOPE IS FOCUSSED ON			REAL THICKNESS R_3-R_1 (cm)	APPARANT THICKNESS R_3-R_2 (cm)	$\mu=\frac{R_3-R_1}{R_3-R_2}$
	CROSS MARK WITHOUT SLAB (R_1) cm	CROSS MARK WITH SLAB (R_2) cm	LYCOPODIUM POWDER (R_3) cm			
1.	0cm	0.39cm	1.2cm	1.2cm	0.81cm	1.5
2.	0.cm	0.40cm	1.23cm	1.23cm	0.83cm	1.48
3.	0cm	0.41cm	1.19cm	1.19cm	0.78cm	1.52

$$\mu = \frac{\mu_1+\mu_2+\mu_3}{3}$$

$$= \frac{1.5+1.48+1.52}{3}$$

$$= \frac{4.5}{3}$$

$$\mu = 1.5$$

Date 23/07/13

Expt. No. 06 Page No. 07

TRAVELLING MICROSCOPE

AIM: To determine refractive index of a glass slab, using travelling microscope.

APPARATUS: glass slab, a travelling microscope, lycopodium powder,

THEORY:

$$a\mu_g = \frac{\text{real thickness of slab}}{\text{apparent thickness of slab}}$$

RESULT:

The ratio of $\frac{R_3 - R_1}{R_3 - R_2}$ is ~~constant~~

It gives the refractive index of glass slab

Refractive index of glass slab is 1.5

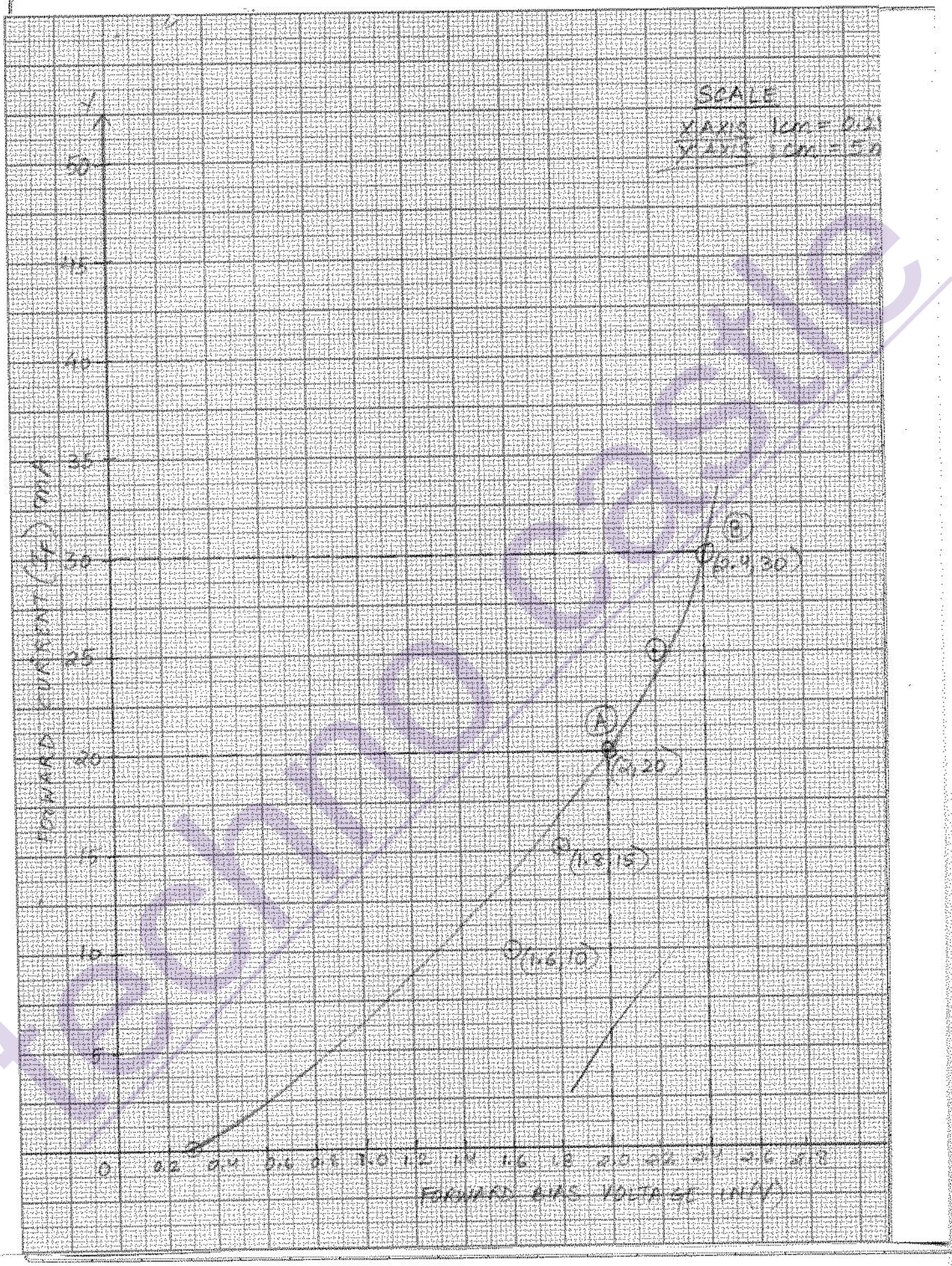
PRECAUTIONS:

1) In microscope, the parallax should be properly removed
2) The microscope should be moved in upper direction only to avoid back lash error

SOURCES OF ERROR:

1) The microscope scale may not be properly calibrated

Teacher's Signature : _____

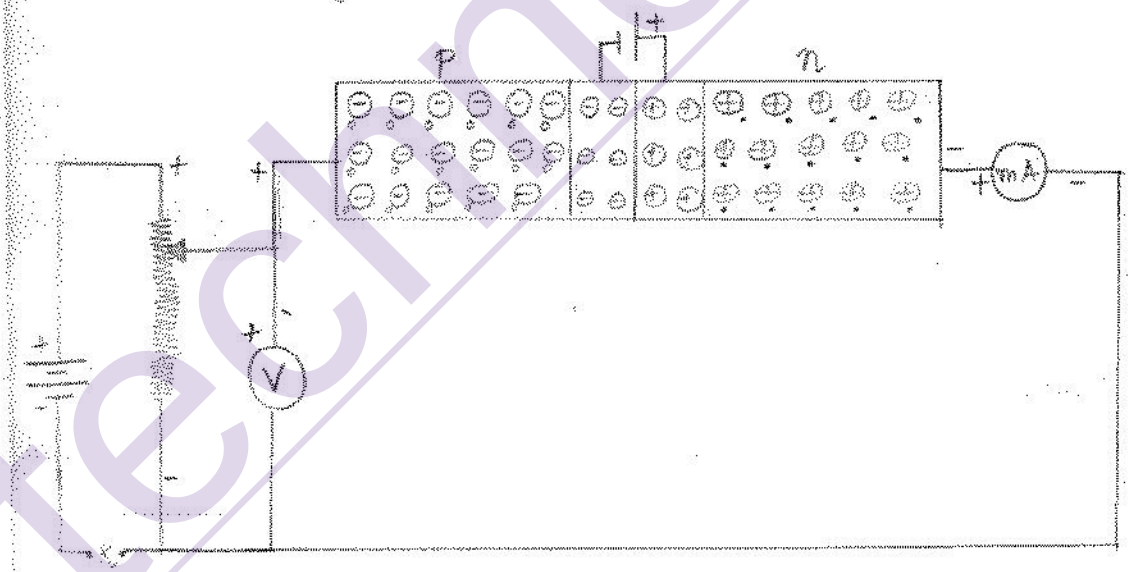

SCALE
Y AXIS 1cm = 0.2
X AXIS 1cm = 5
50
45
40
35
30
25
20
15
10
5
0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
B (0.4, 20)
A (1, 20)
C (1.8, 15)
D (1.6, 10)

Range of VOLTMETER : 0-3V
least count of voltmeter : 0.1V
Range of AMMETER : 0-50mA
least count of ammeter : 1mA

S.NO	FORWARD VOLTAGE	FORWARD CURRENT
1.	0V	0 mA
2.	0.1V	0 mA
3.	0.3V	0 mA
4.	0.4V	0.5 mA
5.	1.2	5 mA
6.	1.6	10 mA
7.	1.8	15 mA
8.	2	20 mA
9.	2.2	25 mA
10.	2.4	30 mA

ΔV_F (1 to 5) = 0.4V ΔI_F = 10mA

$$R = \frac{V}{I} = \frac{\Delta V_F}{\Delta I_F} = \frac{0.4 \times 10^{-3}}{10} = 40\,\Omega$$



Date 20/07/13

Expt. No. 07 Page No. 08

P-N-JUNCTION UNDER FORWARD BIAS

AIM: To draw I-V characteristics curve of a p-n-junction in forward bias

APPARATUS: A p-n diode, a 3-Volt battery, a 50 volt battery, a High resistance, rheostat, 0-3V voltmeter, 0-50V voltmeter, 0-100mA ammeter, one way key, connecting wires, sand paper

THEORY: Forward-bias characteristics: When the p-section of the diode is connected to +ve terminal of a battery and n-section to -ve terminal of battery it is said to be forward biased. With increase in voltage, the forward current increases slowly in the beginning and then rapidly at 0.7V for si diode, current increases rapidly. This is called threshold voltage

RESULT:

Junction resistance in forward bias = 40 ohms

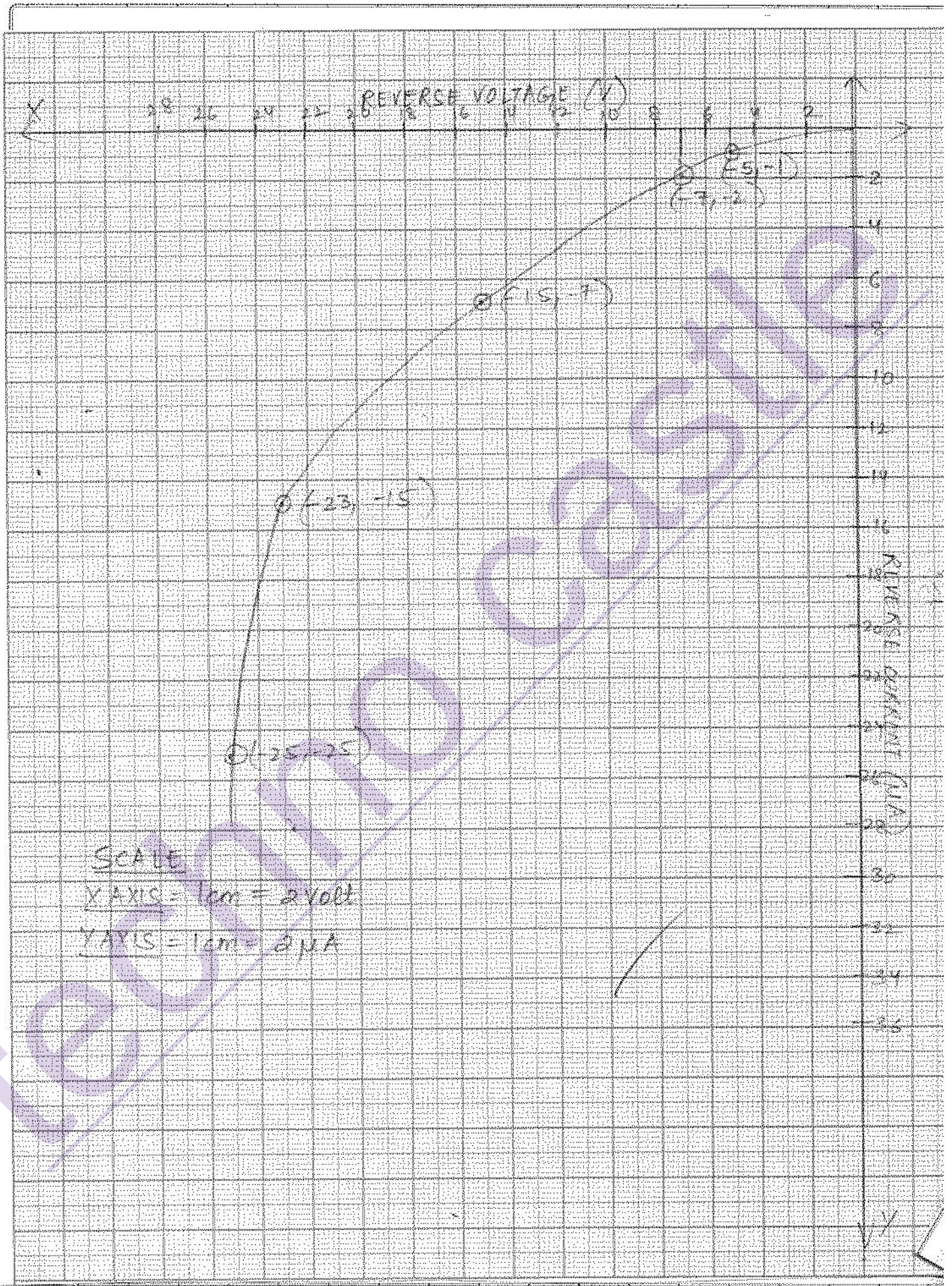
PRECAUTIONS:

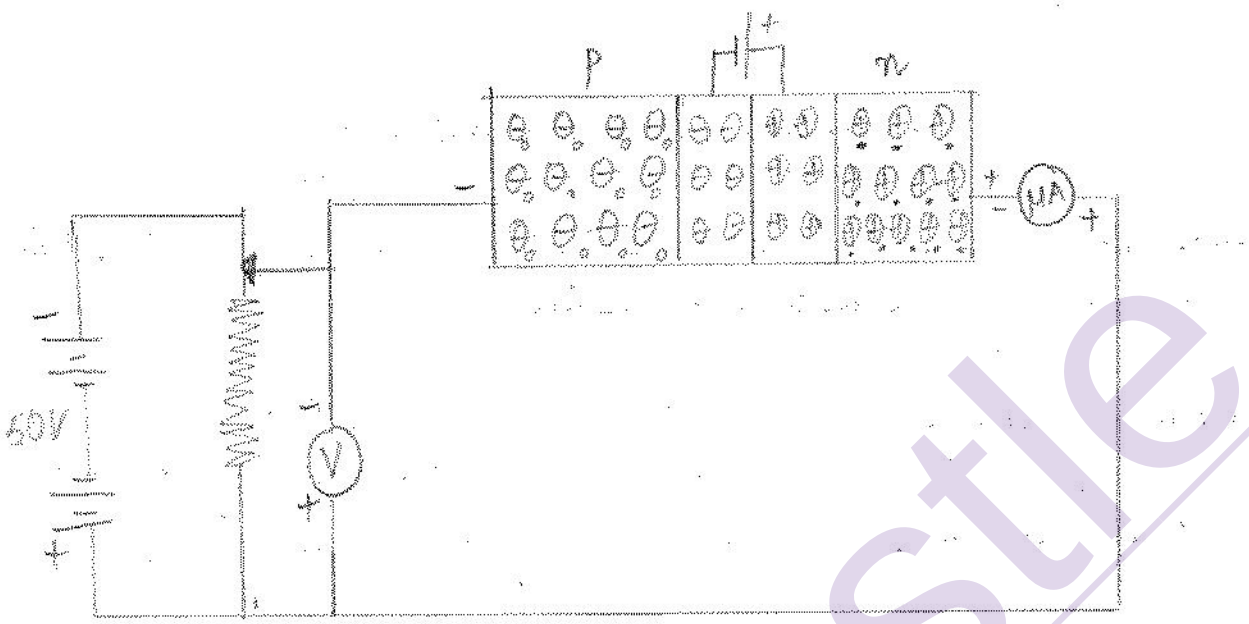
1) All connections should be neat, clean and tight
2) Key should be used in circuit and opened when circuit is not used

SOURCES OF ERROR:

1) The junction diode supplied may be faulty

Teacher's Signature : _____


REVERSE VOLTAGE (V)
REVERSE CURRENT (μA)
(-15, -7)
(-23, -15)
(-35, -25)
SCALE
X AXIS = 1cm = 2 Volt
Y AXIS = 1cm = 2 μA



S.NO	VOLTAGE	CURRENT (μA)
1.	0	0
2.	.5	1
3.	1	2
4.	1.5	4
5.	1.7	9
6.	1.9	11
7.	2.3	15
8.	2.5	25

Date 06/08/13

Expt. No. 08 Page No. 09

P-N-JUNCTION UNDER REVERSE BIAS

AIM: To draw I-V characteristic curve of a p-n junction in reverse bias.

APPARATUS: a p-n junction diode, a 3volt battery, a 50volt battery, a high resistance rheostat, 0-50V voltmeter, 0-100μA ammeter, one way key, sand paper, connecting wires.

THEORY: When p-junction is connected to -ve terminal of battery and n-junction to +ve terminal, it is said to be REVERSE biased. When reverse bias voltage increases, initially there is less increase in current, but when reverse bias voltage increases to sufficiently high value, reverse current increases to large value. This is called zener breakdown voltage.

RESULT: Junction resistance for reverse bias = $2 \times 10^6 \Omega$.

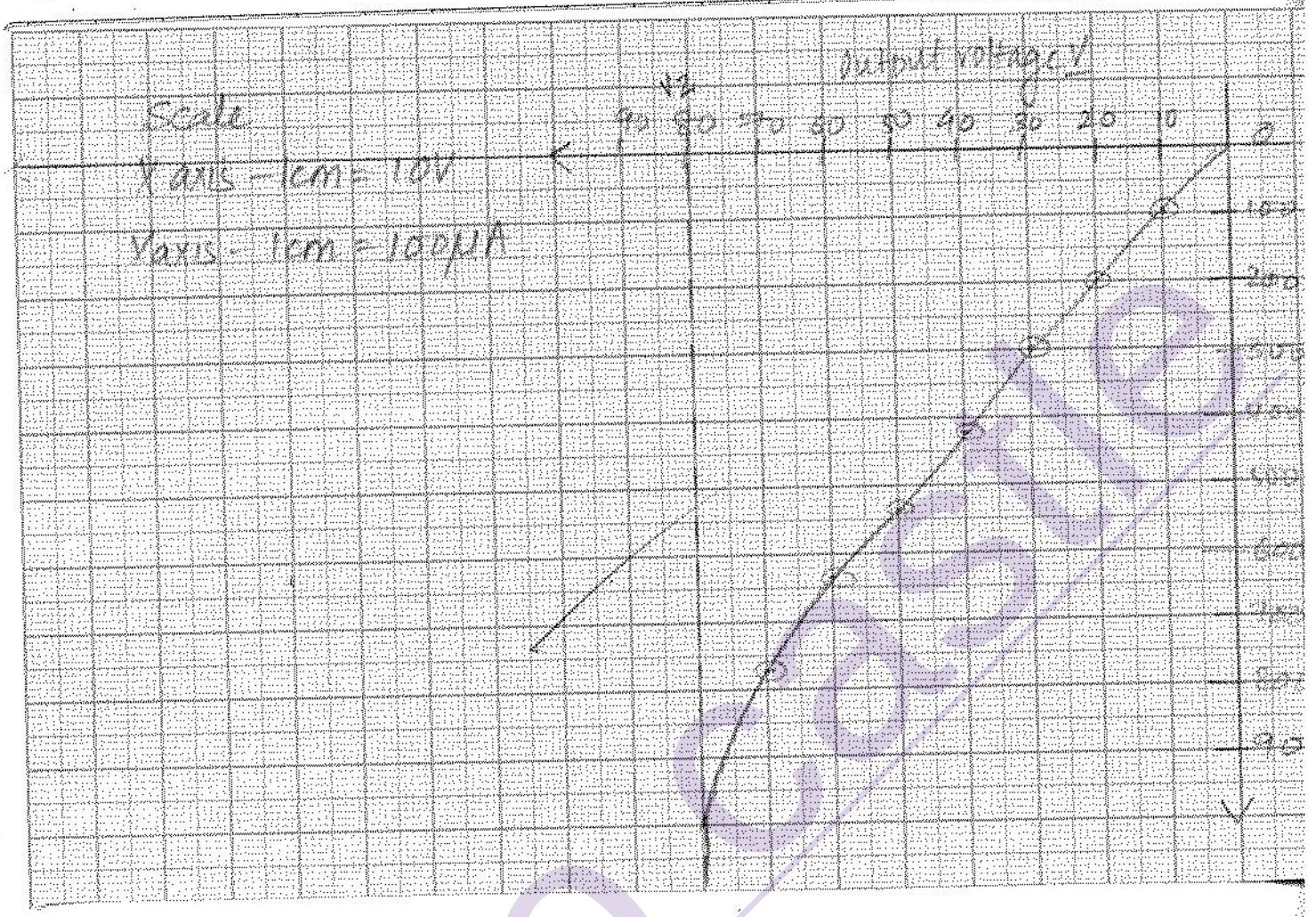
PRECAUTIONS:

1. All connections must be neat, clean and tight.
2. Reverse bias voltage beyond breakdown should not be applied.

SOURCES OF ERROR:

1. Junction diode supplied may be faulty.

Teacher's Signature :



S.NO	OUTPUT VOLTAGE (V)	CURRENT (μA)
1.	10	100
2.	20	200
3.	30	300
4.	40	420
5.	50	540
6.	60	640
7.	70	760
8.	80	—

Date 20/08/13

Expt. No. 09 Page No. 10

CHARACTERISTICS OF ZENER DIODE

AIM: To draw the characteristic curve of a zener diode and to determine its reverse breakdown voltage

APPARATUS : A zener diode ($V_Z = 6V$), 10 V battery, a high resistance rheostat, ammeter, voltmeter, one way key, connecting wires.

THEORY : It is a semiconductor diode, in which the n-type and p-type sections are heavily doped. This results in low value of reverse breakdown voltage (BV_R). This is called zener voltage

$V_0 = V_I - R_I I_I$ → input current

↓ Input voltage

Output voltage

R_I – Input resistance

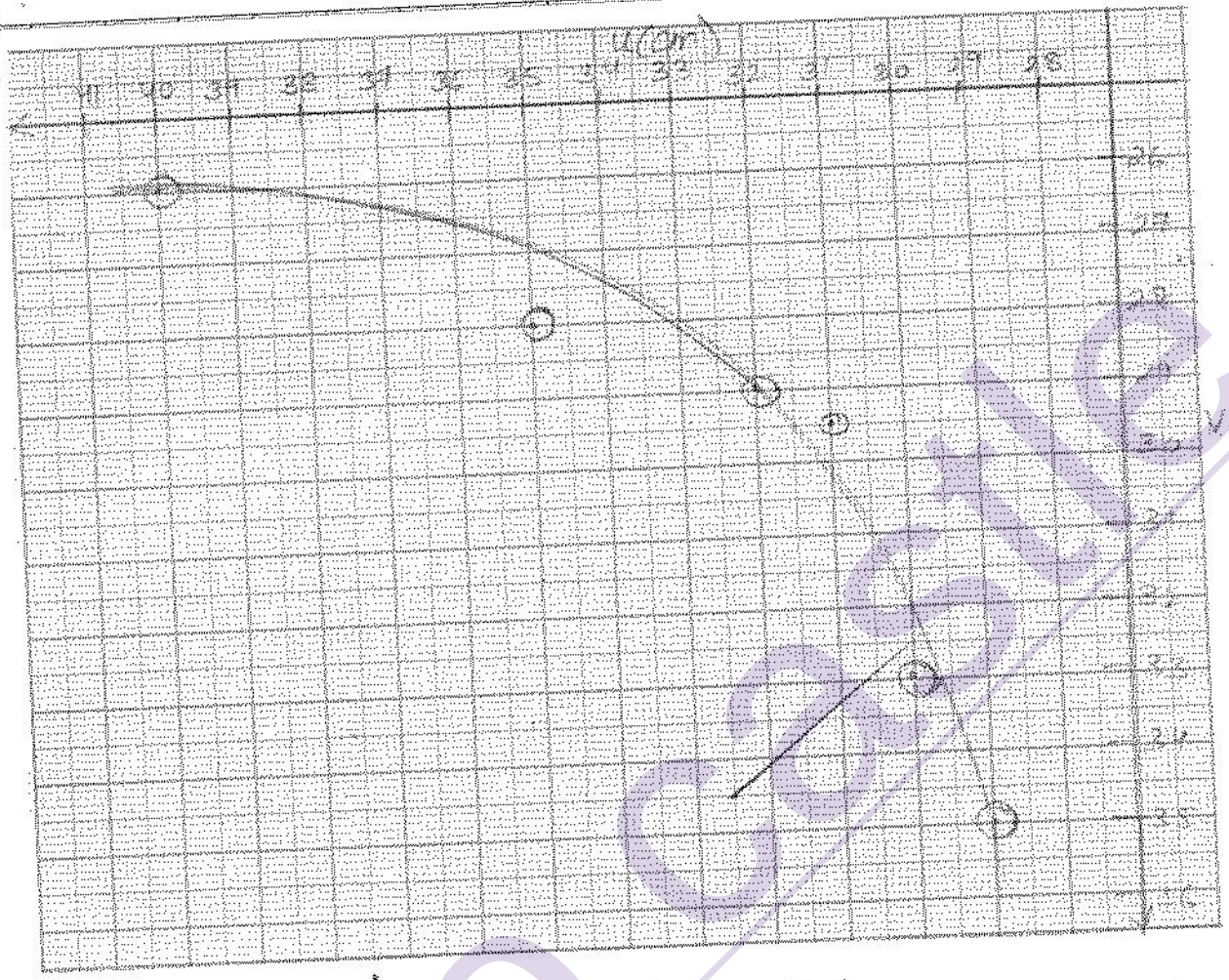
RESULT:

The reverse breakdown voltage of zener diode is 8.0V

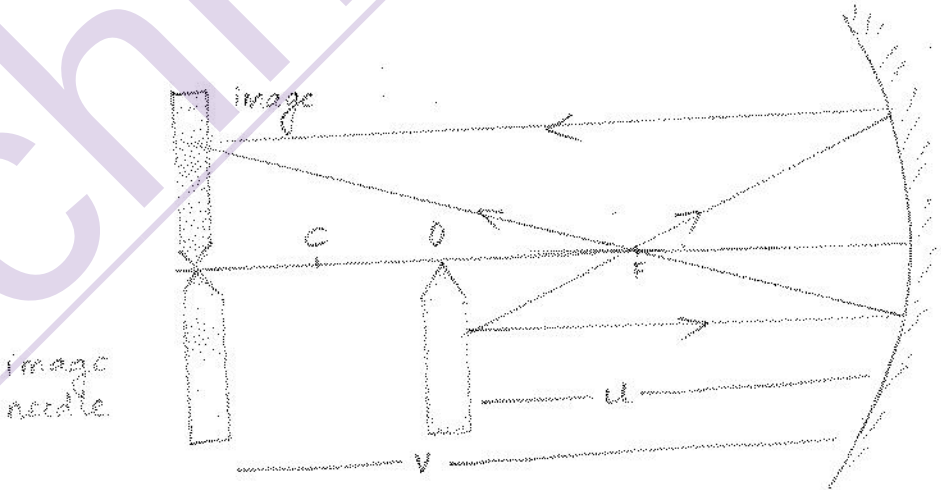
PRECAUTIONS:

1. All connections should be neat, clean, tight
2. Key should be used in circuit.

Teacher's Signature : _____



graph b/w 'u' and 'v'



Date 27/08/13

Expt. No. 10 Page No. 11

FOCAL LENGTH OF CONCAVE MIRROR

AIM: To find focal length of concave mirror by calculating u for different values of u

APPARATUS:

An optical bench alongwith 3 upwights, one mirror holder, 2 needles, concave mirror, a knitting needles, metre scale

THEORY:

Formula used

$$\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$$

$$f = \frac{uv}{u+v}$$

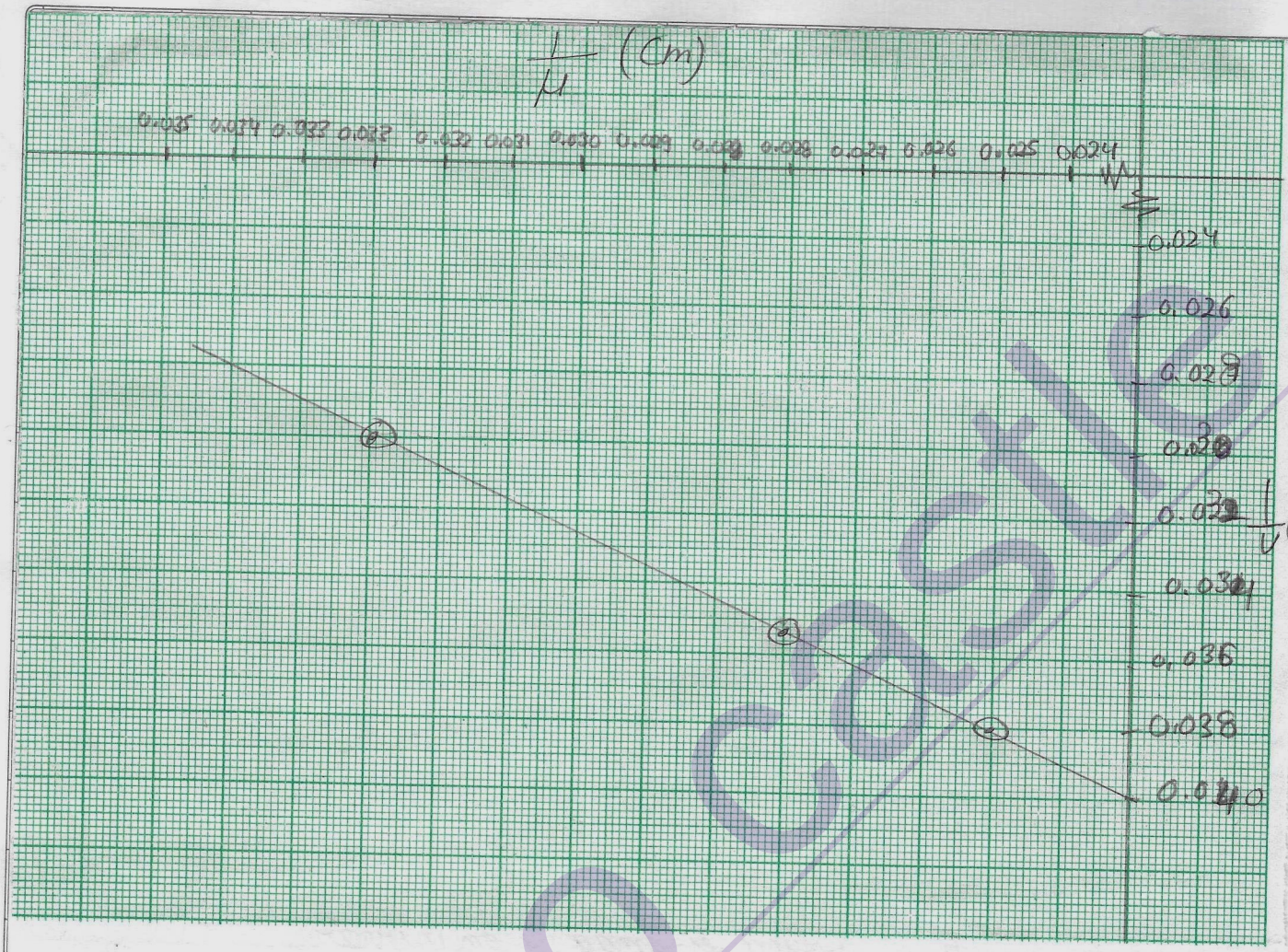
f = focal length
v = distand of image from mirror
u = distance of object from mirror

1) Plot graph between v and u
2) Plot graph between $\frac{1}{v}$ and $\frac{1}{u}$

RESULT:

The focal length of given concave mirror is -15.5 cm

Teacher's Signature : _____



graph b/w $\frac{1}{\mu}$ and $\frac{1}{v}$

S.NO	u(cm)	v(cm)	$\frac{1}{u}(cm^{-1})$	$\frac{1}{v}(cm^{-1})$	$\frac{1}{cm} = \frac{uv}{u+v}$
1	-30	-33	-0.033	-0.030	-15.71
2	-29	-35	-0.034	-0.028	-15.85
3	-35	-28	-0.028	-0.035	-15.55
4	-40	-26	-0.025	-0.038	-15.75
5	-32	-29	-0.031	-0.034	-15.30
6	-31	-29.5	-0.032	-0.033	-15.21

Date 27/8/15

Expt. No. 10 Page No. 12

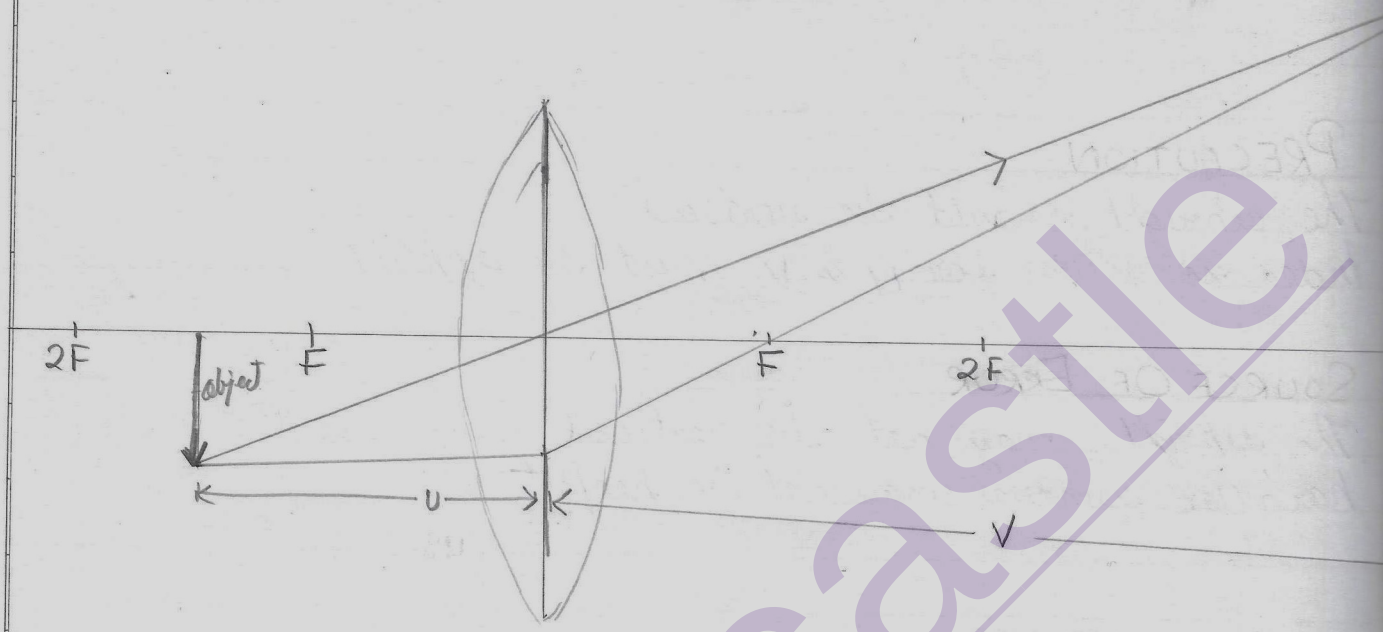
PRECAUTION

The upright should be vertical
Index correction for u & v must be applied

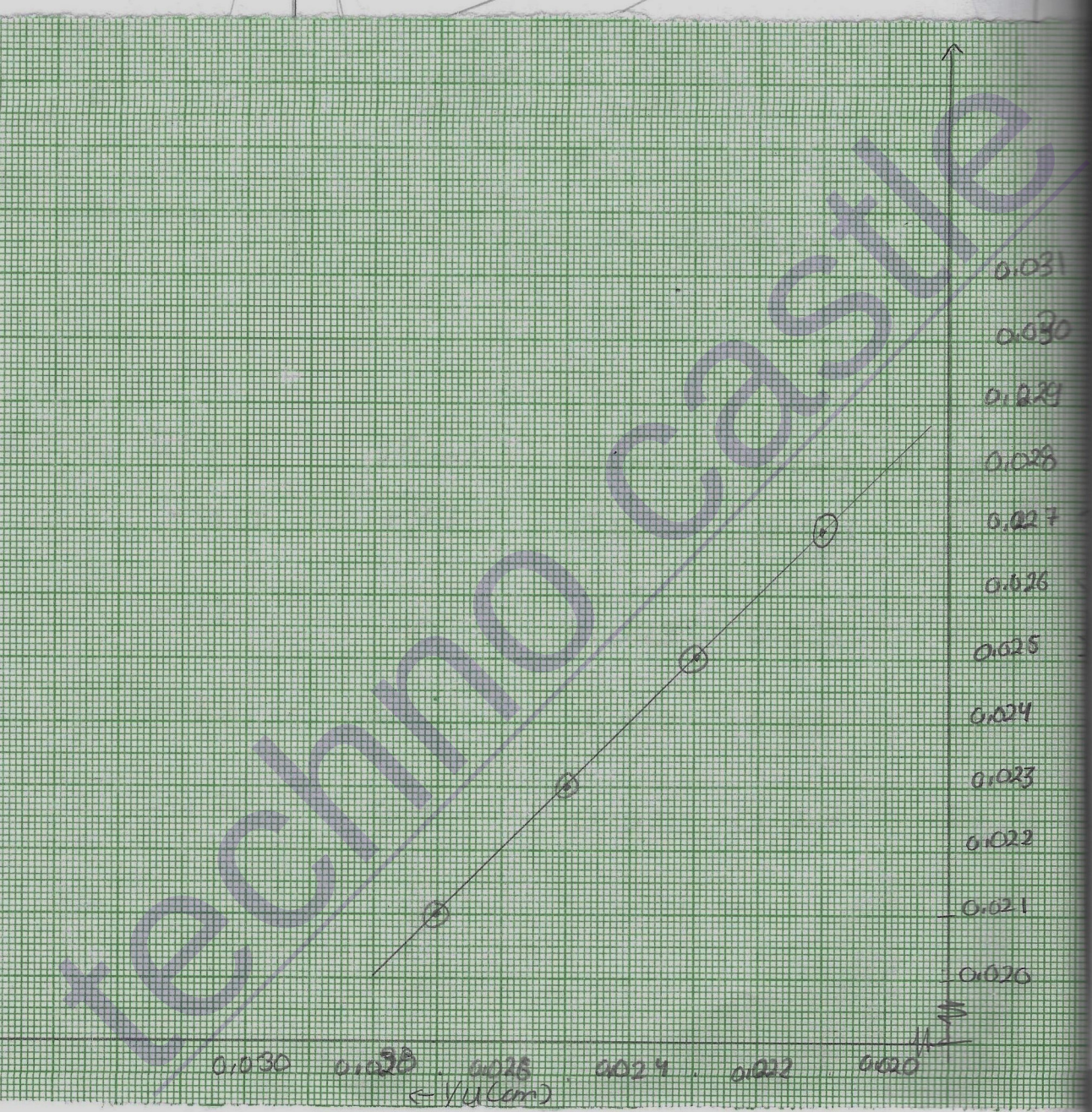
SOURCE OF ERROR

The upright may not be vertical
Parallax removal may not be perfect

Teacher's Signature : _____



Sno	u(cm)	v(cm)	1/u(cm)	1/v(cm)	$f=\frac{uv}{u+}$
1	-40	+43	0.025	0.023	20
2	-43	40	0.023	0.025	20.
3	-37	47	0.027	0.021	20.
4	-47	37	0.021	0.27	20.


0.031
0.030
0.029
0.028
0.027
0.026
0.025
0.024
0.023
0.022
0.021
0.020
0.030
0.028
0.026
0.024
0.022
0.020
← 1/V (cm³)


-48 -46 -47 -46 -45 -44 -43 -42 -41 -40 -39 -38 -37
← -U (cm)
0,030 0,028 0,026 0,024 0,022 0,020
← 1/U (cm)

Date 30/9/5

Expt. No. 11 Page No. 13

FOCAL LENGTH OF ~~CONCAVE~~ CONVEX LENS

AIM To find focal length of a convex lens & find different values of v for different value of u

APPARATUS

An optical bench, with 3 upright, a convex lens with lens holder 2 optical needle, a half metre scale, a knitting needle

THEORY

Formula Used

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$$

$$f = \frac{uv}{u-v}$$

f = focal length
u = objective distance
v = image distance

RESULT

The focal length of lens = 20.95 cm

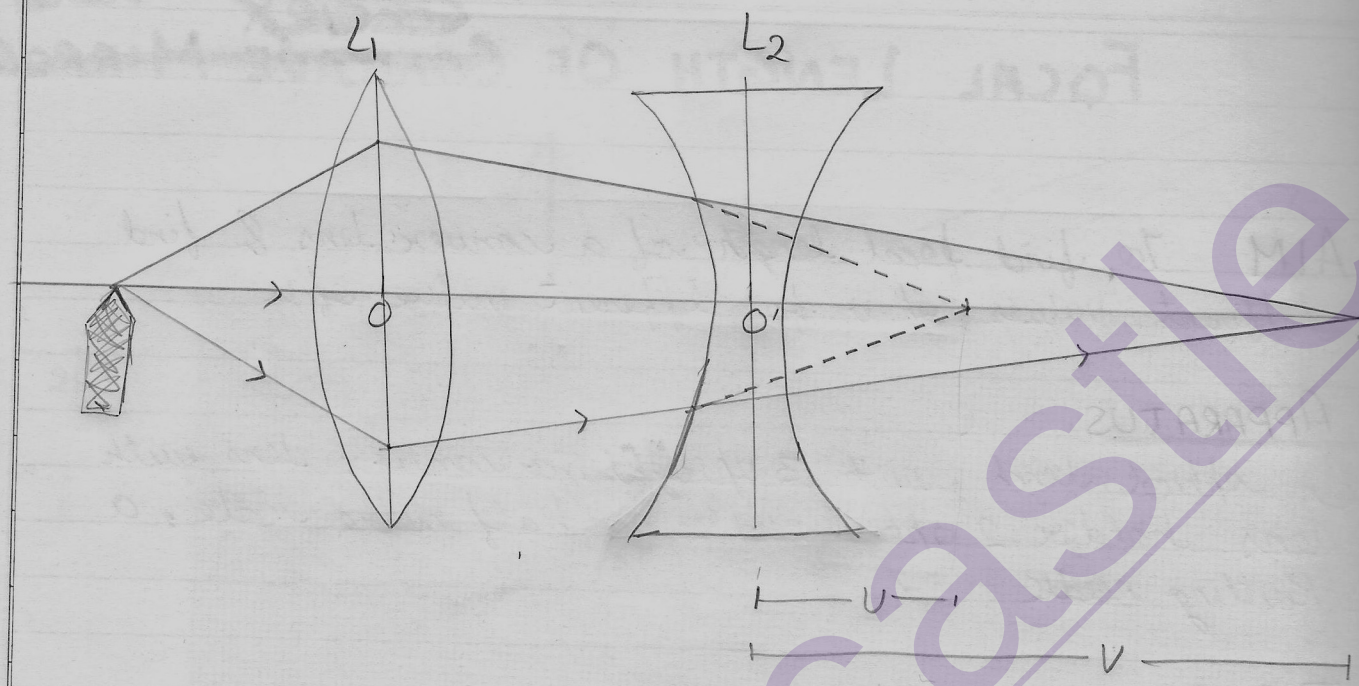
PRECAUTION

Tips of object and needle be should be at same height as the centre of lens
No error correction for u & v must be applied

Source Of Error

Upright may not be vertical
Parallax removal may not be perfect

Teacher's Signature : _____



S.no	U(cm)	V(cm)	f(cm)
1	10cm	20cm	-20cm
2	12cm	31cm	-19.8cm
3	15cm	59cm	-20.2cm
4	11.1cm	25cm	-20cm

Date 3/9/15

Expt. No. 12 Page No. 14

FOCAL LENGTH OF CONCAVE LENS

AIM: To find focal length of a concave lens using a convex lens

Optical bench, 4 upright, convex lens, concave lens, lens holder, 2 optical needles, half meter scale, knitting needle

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$$

$$f = \frac{uv}{u-v}$$

f = focal length
u = objective distance
v = image distance

focal length of concave lens is - 20cm

The lens must be clean
Focal length of concave lens ~~shall~~ be less than f of concave lens

Parallax removal may not be perfect
The upright may not be ~~verified~~ vertical.

Teacher's Signature : _____

Date 03/09/13

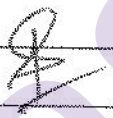
Expt. No. 11

Page No. 14

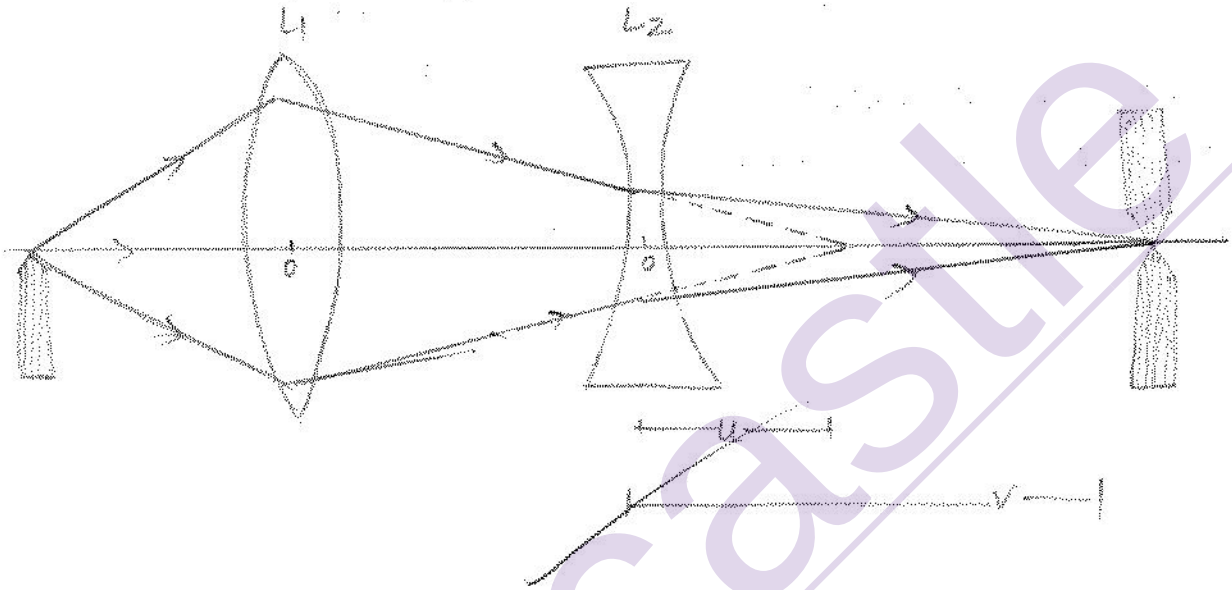
2. Index correction for u and v must be applied

SOURCES OF ERROR:

1. The uprights may not be vertical
2. Parallax removal may not be perfect.



Teacher's Signature : _____



S.No	u (cm)	v (cm)	f (cm)
1.	10cm	20cm	- 20cm
2.	12cm	31cm	- 19.8cm
3.	15cm	59cm	- 20.2cm
4.	11.1cm	25cm	- 20cm

Date 10/09/13

Expt. No. 12 Page No. 15

FOCAL LENGTH OF CONCAVE LENS

AIM: To find focal length of a concave lens using a convex lens.

APPARATUS: optical bench, 4 uprights, convex lens, concave lens, lens holders, 2 optical needles, half metre scale, knitting needle

THEORY:

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$$

$$f = \frac{u \cdot v}{u - v}$$

f = focal length
u = object distance
v = image distance

RESULT:

focal length of concave lens is −20 cm

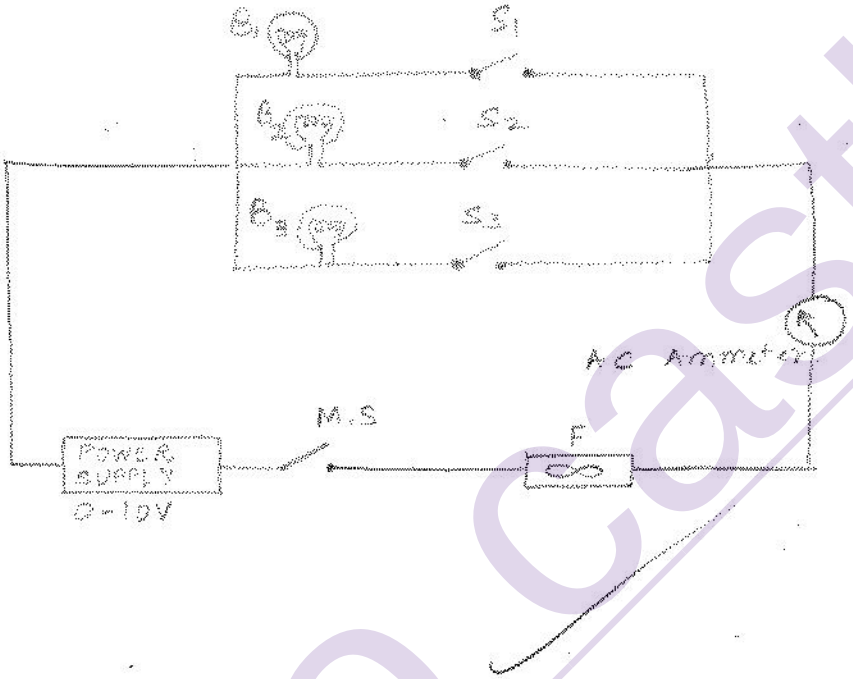
PRECAUTIONS:

1. The lens must be clean
2. focal length of convex lens should be less than f of concave lens.

SOURCES OF ERROR

1. Parallax removal may not be perfect
2. The uprights may not be vertical

Teacher's Signature :



Date 17/09/13

Expt. No. ACT. I

Page No. 16

ACTIVITY 1

AIM: To assemble a household circuit, comprising three bulbs, switches, fuse and a power source.

APPARATUS: Bulbs, fuse, battery, fuse wire

THEORY: Formula used for calculating Power

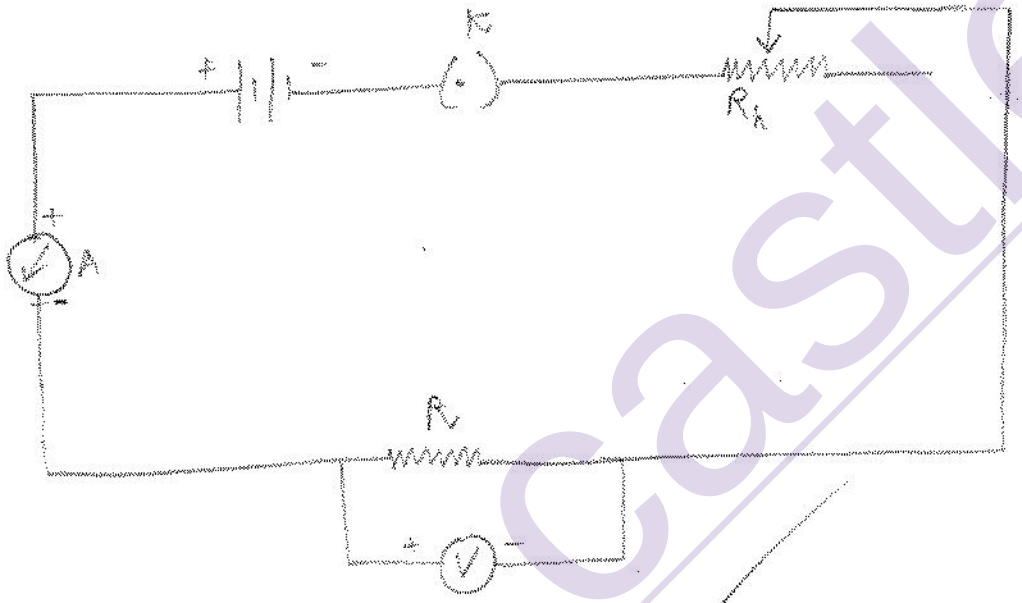
$$P = \frac{V^2}{R} = I^2R = VI$$

$$P_{net} = P_1 + P_2 + P_3 \ldots P_n$$

PROCEDURE:

1) Connect the bulbs B_1, B_2, B_3 in series with switches S_1, S_2 and S_3 resp and connect each set of B-S in parallel with each other.
2) Connect main supply to a step down transformer to get required voltage from 0 - 10V
3) Connect the main fuse MS in series with the power supply.
4) Connect an A.C. ammeter in series with the B-S set.
5) Connect one end of power supply to one end of B-S set
6) Check the circuit one again to ensure that household circuit is complete.
7) Gradually increase the current to 0.75A, the fuse burns at 0.6A.

Teacher's Signature



Date 18/09/13

Expt. No. ACT II Page No. 17

ACTIVITY

AIM: To assemble the components of a given electrical circuit

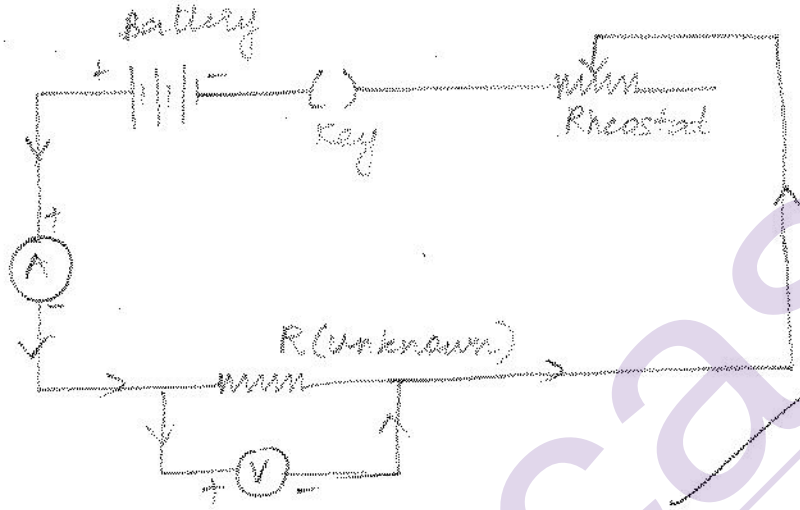
APPARATUS: voltmeter, ammeter, battery, a rheostat, conneting wires, sand paper, resistance coil.

PROCEDURE:

1) connect the components as shown in fig.
2) connect the ammeter in series with circuit
3) connect voltmeter in parallel to resistor
4) connect switch in series with battery
5) assemble all components and circuit is complete

UTILITY: It is used for measuring unknown resistance.

Teacher's Signature : _____



Date 24/09/13

Expt. No. ACT III

Page No. 18

ACTIVITY 3

AIM: To draw the diagram of a given open circuit comprising at least a battery, resistor, Key, ammeter and voltmeter.

APPARATUS: battery eliminator, rheostat, resistance box, key, ammeter, voltmeter

THEORY: An open circuit is combination of primary components of electric circuit in such a manner that on closing the circuit no current is drawn from the battery.

PROCEDURE:

Ammeter: to be connected in series with the eliminator

Voltmeter: to be connected in parallel to resistor

Rheostat: connected in series with eliminator.

Resistance coil: connected in parallel

One way key: connected in series to battery eliminator

Connect components correctly as per circuit diagram

Teacher's Signature : _____

Date 25/09/13

Expt. No. ACT IV

Page No. 19

ACTIVITY 4

AIM: To study the nature and size of the image formed by a concave mirror on a screen by using a candle and a screen.

APPARATUS: Optical bench, three uprights, concave mirror, holder, candle, card board screen.

THEORY: $\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$

$u = \infty$	$v = -f$
$u = -2f$	$v = -2f$
$u = -f$	$v = \infty$

PROCEDURE: Find rough focal length of concave mirror by usual method

1) Mount the concave mirror, screen and candle as shown.
2) Adjust the mirror to get inverted, erect image of candle on screen.
3) As the object is moved towards the mirror, the image gets enlarged slowly. Then after reaching a distance equal to f, no image is seen.
This focal length can be measured.

Teacher's Signature : _____

Date 1/10/13

Expt. No. ACT V

Page No. 20

ACTIVITY 5

AIM: To observe diffraction of light through a thin slit between sharp edges of razor blade.

APPARATUS: 2 razor blades, adhesive tapes, monochromatic lights, black paper, glass plate

Formula used

$$\sin\theta = \frac{n\lambda}{d}$$

d = width of slit

θ = angle of diffraction

n = order of diffraction

λ = wavelength of light.

PROCEDURE:

1) Fix the black paper on glass plate using adhesive
2) place 2 razor blades so that their sharp edges are parallel and extremely close to each other to form a narrow slit b/w them.
3) Throw a beam of light on the slit by laser pencil
5) A diffraction pattern of alternate bright and dark bands is seen on the wall

CONCLUSION:

When light waves are incident on a slit or aperture then it bends away at corners of slit showing the phenomena of diffraction of light.

Teacher's Signature : _____

POWER		FOCAL LENGTH	
P_1	P_2	f_1	f_2
2	8	50cm	12.5cm
4	6	25cm	16.7cm
5	5	20cm	20cm

Date 2/10/13

Expt. No. ACT VI

Page No. 21

ACTIVITY VI

AIM: To obtain a lens combination with the specified focal length by using 2 lenses from given set of lenses.

APPARATUS: lenses, lens holders, stand, metre scale

THEORY:

$$\frac{1}{f} = \frac{1}{f_1} + \frac{1}{f_2}$$ (f = focal length)

$$P = P_1 + P_2$$ (P = power)

PROCEDURE: Keep the white painted vertical wooden board to serve as a screen.

1. The convex lens fixed into a holder is moved towards left of screen and then right to get sharp image.
2) The lens is moved towards and away from the screen till a sharp image is formed.
3) Then use second lens and find focal length.
4) Calculate Power using 'f'

Teacher's Signature :

Date 7/10/13

Expt. No. ACT VII

Page No. 22

ACTIVITY 7

AIM: To observe polarisation of light using two polaroids

APPARATUS: Thin glass slab, monochromatic light, polaroid

THEORY: When an unpolarised is made to incident on interface of 2 transparent media at polarising angle, refracted and reflected rays are at 90°.

PROCEDURE:

1) Keep a thin glass sheet in a horizontal plane surface with a hole under sheet
2) Take a beam of monochromatic light having parallel rays and make it incident on upper face of glass sheet.
3) Adjust the angle of incidence to 57.5°
4) Observe reflected and refracted ray. They are ⊥ to each other

RESULT:

When the two polaroids are ∥ to each other, transmitted light is passed through it But when they are ⊥, there is no transmitted light. The light has transverse nature

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