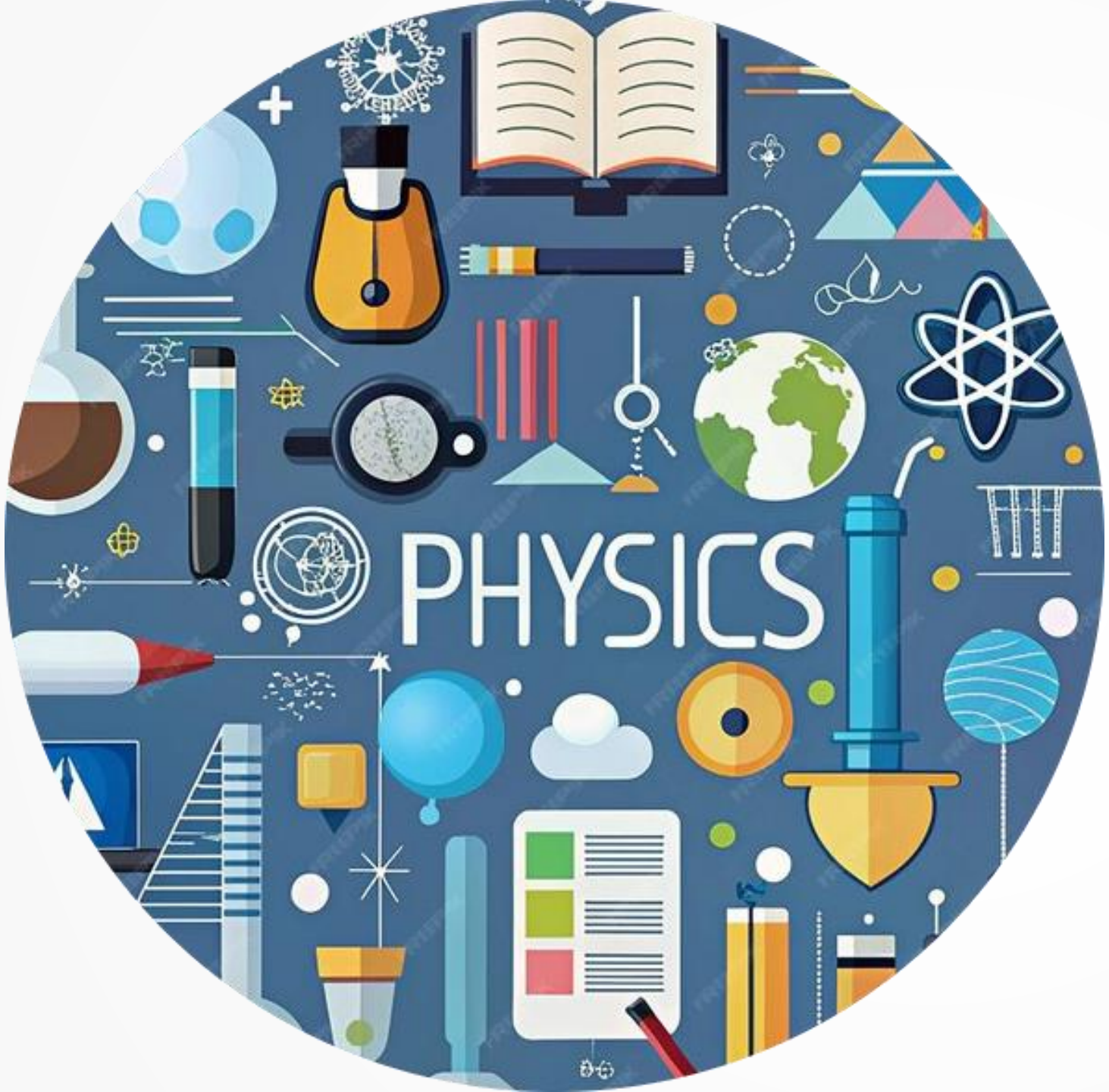


Md. Hasibur Rahman

Lecturer

Department of Physics & Astronomy,

University of Global Village, Barishal

Course Title: Physics-II Optics, Modern Physics, Thermodynamics Sessional

Rationale: This course provides hands-on experience with fundamental experiments that enhance understanding of core principles in mechanics, elasticity, electricity, and magnetism. Students will measure physical constants like gravitational acceleration, spring constant, and modulus of rigidity, along with electrical properties such as resistance and EMF. This course develops analytical, experimental, and problem-solving skills, fostering a deeper comprehension of theoretical concepts through practical application.

Course Credit: 1

Course Code: PHY 0533-1202

Class: 17 Weeks (2 Hour Practical class per week)

Total Marks: 50

Total: 26 weeks per semester

Exam/ Result: 06 weeks

Holiday/ Leave: 3 weeks

ASSESSMENT STRATEGY

Assessment Method	(100%)
Class Assessment	
Conduct of Lab Test /Class Performance	25%
Report Writing/Programming	15%
Mid-Term Evaluation (Exam/Project/assignment)	20%
Final Evaluation (Exam/Project/assignment)	30%
Viva Voce / Presentation	10%
Total	100%

Course learning outcomes (CLO): After successful completion of the course *Optics, Modern Physics, and Thermodynamics*, students will be able to

CLO1: Familiarize with different parameters regarding waves and oscillations, optics, mechanics, electricity and thermal physics, etc.

CLO2: Be capable of describing the different phenomena regarding waves and oscillations, optics, mechanics, electricity and thermal physics, etc.

CLO3: Be skilled in constructing experiments by an individual or a group to determine different phenomena regarding waves and oscillations, optics, mechanics, electricity thermal physics, etc.

CLO4: Be able to prepare a report for an experimental work.

TEACHING METHODOLOGY			
Weeks	Intended topics to be covered	Teaching and Learning Strategy	Corresponding CLOs
1	Introductory class: Brief discussion on the total syllabus, basic requirements of the course, evaluation system of the course, grouping, visit to different sections of the laboratory, introduction to different basic equipment	Lecture and Oral Presentation	CLO1, CLO2
	Experimental Work	Experimental	CLO3, CLO4
2	To determine the focal length and hence the power of a convex lens by displacement method with the help of an optical bench.	Lecture and Oral Presentation	CLO1, CLO2
	Experimental Work	Experimental	CLO3, CLO4
3	To determine the focal length and the power of a concave lens by using an auxiliary convex lens.	Lecture and Oral Presentation	CLO1, CLO2
	Experimental Work	Experimental	CLO3, CLO4
4	To determine the angle of a Prism by rotation of the telescope..	Lecture and Oral Presentation	CLO1, CLO2
	Experimental Work	Experimental	CLO3, CLO4

TEACHING METHODOLOGY			
Weeks	Intended topics to be covered	Teaching and Learning Strategy	Corresponding CLOs
5	To determine the refractive index of the material of a Prism.	Lecture and Oral Presentation	CLO1, CLO2
	Experimental Work	Experimental	CLO3, CLO4
6	To determine the wavelength of various spectral lines by the spectrometer is using a plane diffraction grating.	Lecture and Oral Presentation	CLO1, CLO2
	Experimental Work	Experimental	CLO3, CLO4
7	To determine the specific heat of a liquid by the method of cooling.	Lecture and Oral Presentation	CLO1, CLO2
	Experimental Work	Experimental	CLO3, CLO4
8	To determine the value of J, the mechanical equivalent of heat by electrical method.	Lecture and Oral Presentation	CLO1, CLO2
	Experimental Work	Experimental	CLO3, CLO4

TEACHING METHODOLOGY			
Weeks	Intended topics to be covered	Teaching and Learning Strategy	Corresponding CLOs
9	To find the variation of the frequency of A tuning fork with the length of a sonometer (n-l curve) under given tension and hence to determine the unknown frequency of A tuning fork	Lecture and Oral Presentation	CLO1, CLO2
	Experimental Work	Experimental	CLO3, CLO4
10	To determine the minimum angle of deviation of a prism by pin method	Lecture and Oral Presentation	CLO1, CLO2
	Experimental Work	Experimental	CLO3, CLO4
11	To determine the velocity of sound by acoustic transducer.	Lecture and Oral Presentation	CLO1, CLO2
	Experimental Work	Experimental	CLO3, CLO4
12	Review Class	Lecture	
13	Review Class	Lecture	
14	Student Practice Class	Observation	
15	Student Practice Class	Observation	
16	Student Practice Class	Observation	
17	Lab Exam	Observation	

1st Week

Topic: Introductory Class

Introductory Class:

- A brief discussion on the total syllabus,
- Basic requirements of the course, evaluation system of the course, grouping, visit to different sections of the laboratory,
- Introduction to different basic equipment

Overview of the Experiment:

Provide a weekly breakdown of the syllabus:

- **Week 2:** Focal length and power of a convex lens using the displacement method.
- **Week 3:** Focal length and power of a concave lens using an auxiliary convex lens.
- **Week 4:** Measuring the angle of a prism using a rotating telescope.
- **Week 5:** Determining the refractive index of the material of a prism.
- **Week 6:** Wavelength determination of spectral lines using a diffraction grating and spectrometer.
- **Week 7:** Determination of the Minimum Angle of Deviation of a Prism by Pin method
- **Week 8:** Measuring the specific heat of a liquid by the cooling method.
- **Week 9:** Determining the mechanical equivalent of heat (J) using electrical methods.
- **Week 10:** Studying the relationship between frequency and length (n-l curve) with a sonometer and finding unknown tuning fork frequency.
- **Week 11:** Determining the velocity of sound using an acoustic transducer

Course Requirements

Let me outline the key expectations:

- **Attendance:** You must attend at least 75% of the classes to be eligible for evaluation. Missing sessions will impact your grade unless excused for valid reasons.
- **Preparation:** Before coming to the lab, review the experiment assigned for the week. Bring the manual, take notes, and be ready to experiment.
- **Lab Reports:** You'll submit a report detailing your observations and conclusions for every experiment. These reports are critical for your learning and will contribute 30% of your final grade.

Active Participation:
Engage in discussions and group activities.

Laboratory Grouping:

- To make the sessions efficient and collaborative, you'll work in small groups. Each group will share equipment and responsibilities. Group assignments will be shared later today.
- In your groups, ensure tasks are evenly distributed.

For example:

- One person handles measurements.
- Another records observations.
- A third ensures calculations are correct.
- Teamwork is critical for your success.

Laboratory Tour and Equipment Introduction:

Tour: Show students the various sections of the lab: optics, thermodynamics, and acoustics.

Equipment Demonstration:

- Optical Bench: Used for precise optical measurements.
- Spectrometer: For prism and diffraction grating experiments.
- Sonometer: To study sound and frequency.
- Acoustic Transducer: Measures sound velocity.
- Electrical Apparatus: For experiments related to heat and energy transfer.

Laboratory Safety Guidelines:

Safety is a priority in our lab. Here are some essential rules:

1. **Wear appropriate attire:** Lab coats and closed-toe shoes are mandatory.
2. **Handle equipment carefully:** If you're unsure about using any apparatus, ask for help.
3. **Keep the lab clean:** No food, drinks, or distractions like mobile phones.
4. **Emergency procedures:** Familiarize yourself with the location of fire extinguishers, first aid kits, and emergency exits.

Practical Class Activity:

Assign students to their groups.

Tour the lab, introducing each section and equipment.

Discuss how to record observations and write lab reports.

Evaluation System

Your performance will be evaluated as follows:

Lab Reports: 30%

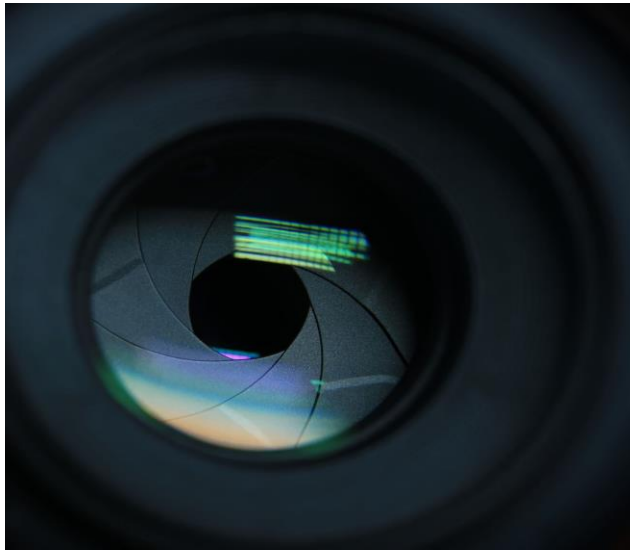
Lab Tests: 40%

Attendance and Participation: 10%

Viva Voce (Oral Examination): 20%

Lab tests will be conducted at the end of the completion of all lectures. During the viva, I may ask you questions about the theory, procedure, or observations of experiments

2nd Week



Topic:

Determination of the Focal Length and Power of a Convex Lens Using the Displacement Method

Experiment 01:

Determination of the Focal Length and Power of a Convex Lens Using the Displacement Method

Objective:

•To determine the focal length (F) of a convex lens.

•To calculate the power (PPP) of the lens.

Apparatus:

•Optical bench, convex lens, lens holder, object pin, screen, measuring scale.

Theory:

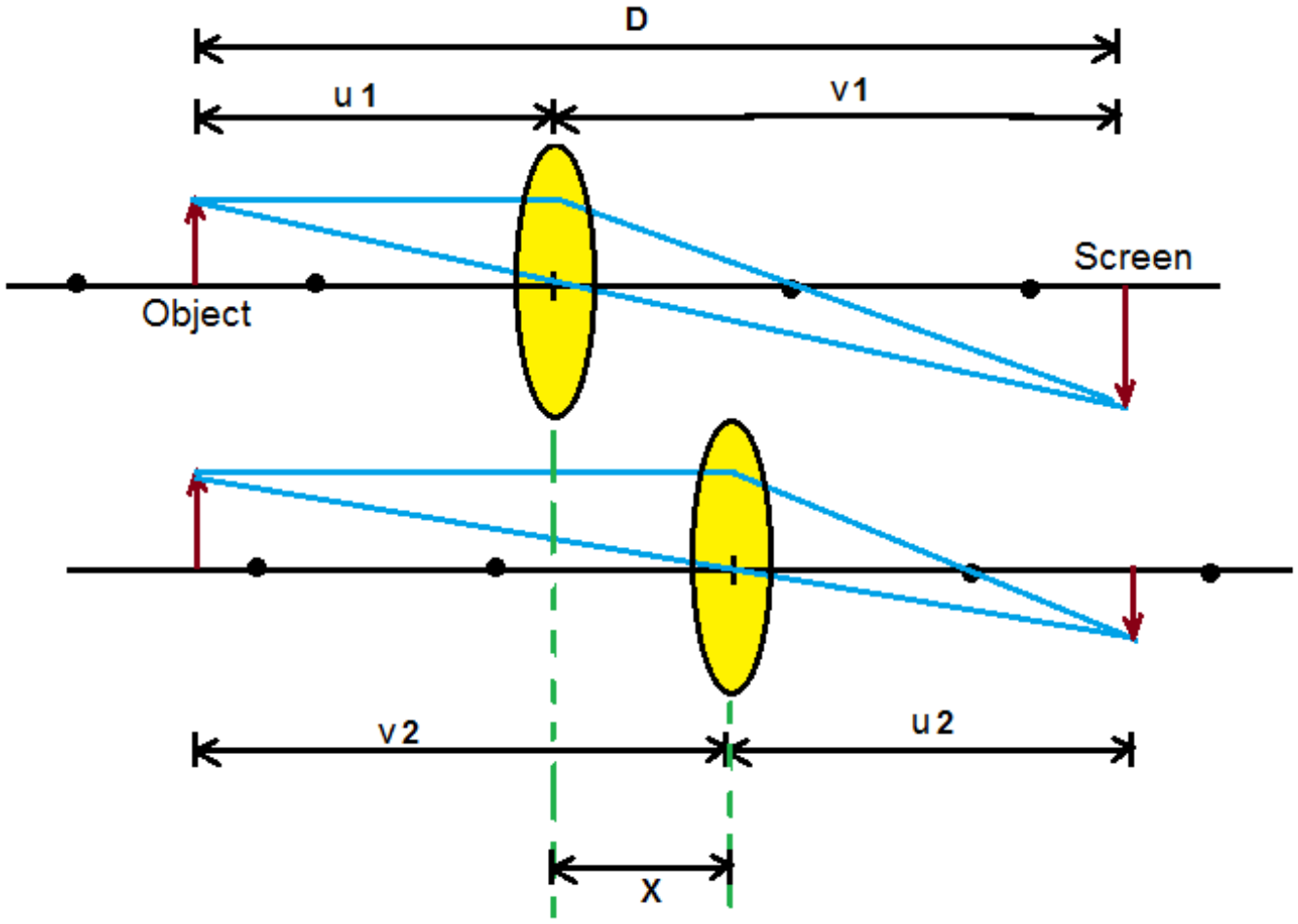
•A convex lens converges parallel rays of light to a focal point.

•The focal length is calculated using the **displacement method**:

- Fix the object and screen at a known distance.
- Move the lens to two positions where sharp images are formed on the screen.
- Use the formula $f = \frac{D^2 - L^2}{4D}$

where D = distance between object and screen, and L = distance between the two lens positions.

- Power (P) is given by $P = \frac{100}{f} \text{ (in diopters)}$


D
u 1
v1
Screen
Object
v 2
u 2
X

Procedure:

- Fix the object and screen on an optical bench with a known distance between them.
- Place the convex lens on the optical bench between the object and the screen.
- Move the lens to find two positions where sharp images form on the screen.
- Measure the distance (L) between the two lens positions.
- Record the object-to-screen distance (D).
- Perform multiple trials for accuracy.
- Tabulate the observations and compute averages.
- Write a detailed report including calculations
- **For detailed read the First Reference Book**

Results :

(A) Index error (λ) for D.

Table I

Length of the index rod in cm (l)	Difference of bench scale readings in cm when the two ends of index rod touch the object and the screen (d)	Index correction for D in cm $\lambda = (l - d)$

(B) Readings for D and x.

Table II

No. of obs.	Position of				Displacement of lens $x = L_1 \sim L_2$ (cm)	Apparent distance between object and image $D' = O \sim I$	Corrected distance bewteen object and image $D = D' + \lambda$
	Object (O)	Image (I)	Lens at				
			L_1	L_2			
1			...	...			
2			...	...	...	...	...
3	...	...	...	...			

(C) Table for calculation of f

Table III

No. of obs.	Lens displacement x rom Tab. II	Corrected distance d from Tab. II	Focal length $f = \frac{D^2 - x^2}{4D}$	Mean focal length (f) cm	Power $P = \frac{100}{f}$ dioptes
1					
2					
3					

3rd Week

Topic:

Second Experiment

Experiment 2:

Focal Length and Power of a Concave Lens Using an Auxiliary Convex Lens

Objective:

- To determine the focal length and power of a concave lens.

Apparatus:

- Concave lens, convex lens, optical bench, measuring scale.

Theory:

- A concave lens diverges light, forming a virtual image.
- Use an auxiliary convex lens to form a real image.

The focal length of the concave lens is calculated using:

$$\frac{1}{F} = \frac{1}{f_1} - \frac{1}{f_2}$$

- where F = focal length of the concave lens, f1 = focal length of the convex lens, and f2 = effective focal length of the combination.

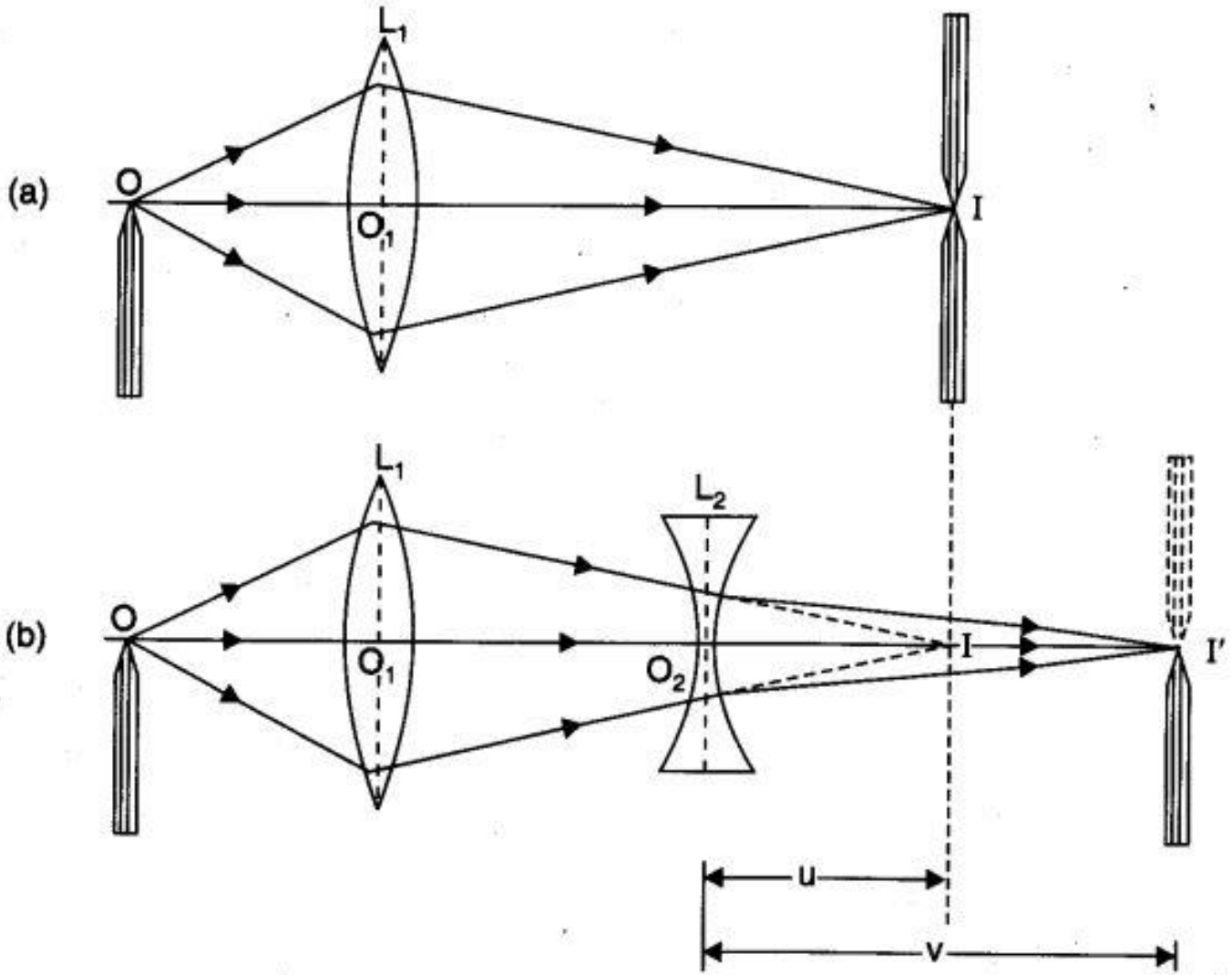


Fig. Focal length of a concave lens.

Procedure:

1. Fix the object and screen at a known distance on the optical bench.
2. Place the convex lens and find its focal length first.
3. Attach the concave lens to the convex lens and position the combination.
4. Adjust the combination to form a sharp image on the screen.
5. Measure the effective focal length f2) of the combined lenses.
6. Repeat the experiment for consistency.
7. Record all distances and observations.
8. Calculate the power of the concave lens Document results with diagrams and tables.

Results :

(A) Data for index error (λ) between the concave lens and the screen.

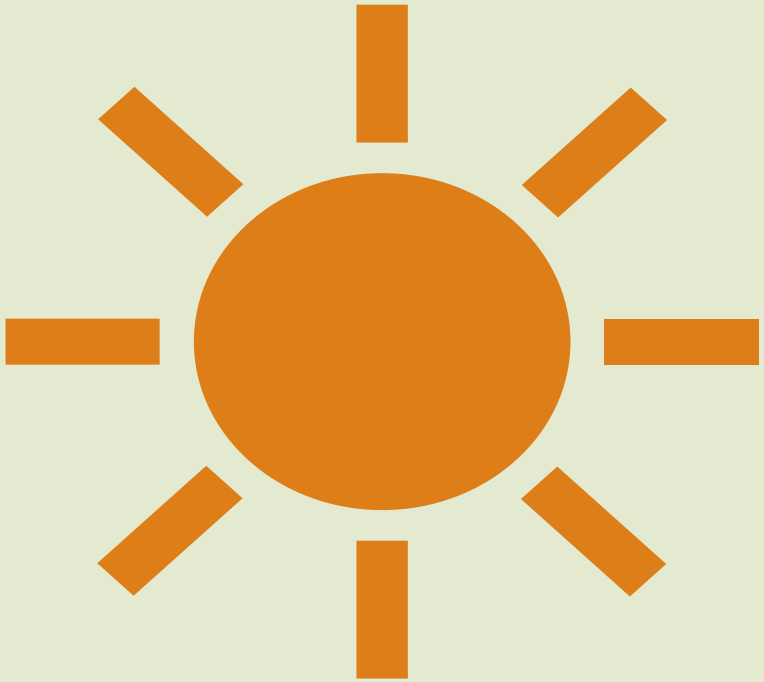
Table I

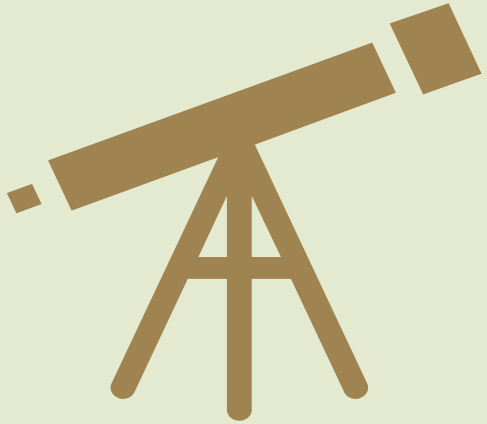
Length of index rod in cm (l)	Diff. of bench-scale readings in cm when the two ends of the index rod touch the concave lens and the screen (d)	Index correction in cm λ = (l - d)
...	...	...

(B) Table for u and v.

Table II

No. of obs.	Positions of					Apparent object distance u'= L~P	Apparent image distance v'=L~I	u=u'+λ	v=v'+λ
	Object (O)	Convex lens (L_1)	Image with convex lens (P)	Concave lens (L)	Image with combination (I)				
1	...	...	...	...	...	...	...	...	...
2				...	...	...	...	...	...
3				...	...	...	...	...	...
4				...	...	...	...	...	...





4th Week

Topic: To determine the angle of a Prism by rotation of the telescope.

Expt.03

To determine the angle of a Prism by rotation of the telescope.

Objective:

•To determine the angle of a prism.

Apparatus:

•Prism, spectrometer, telescope.

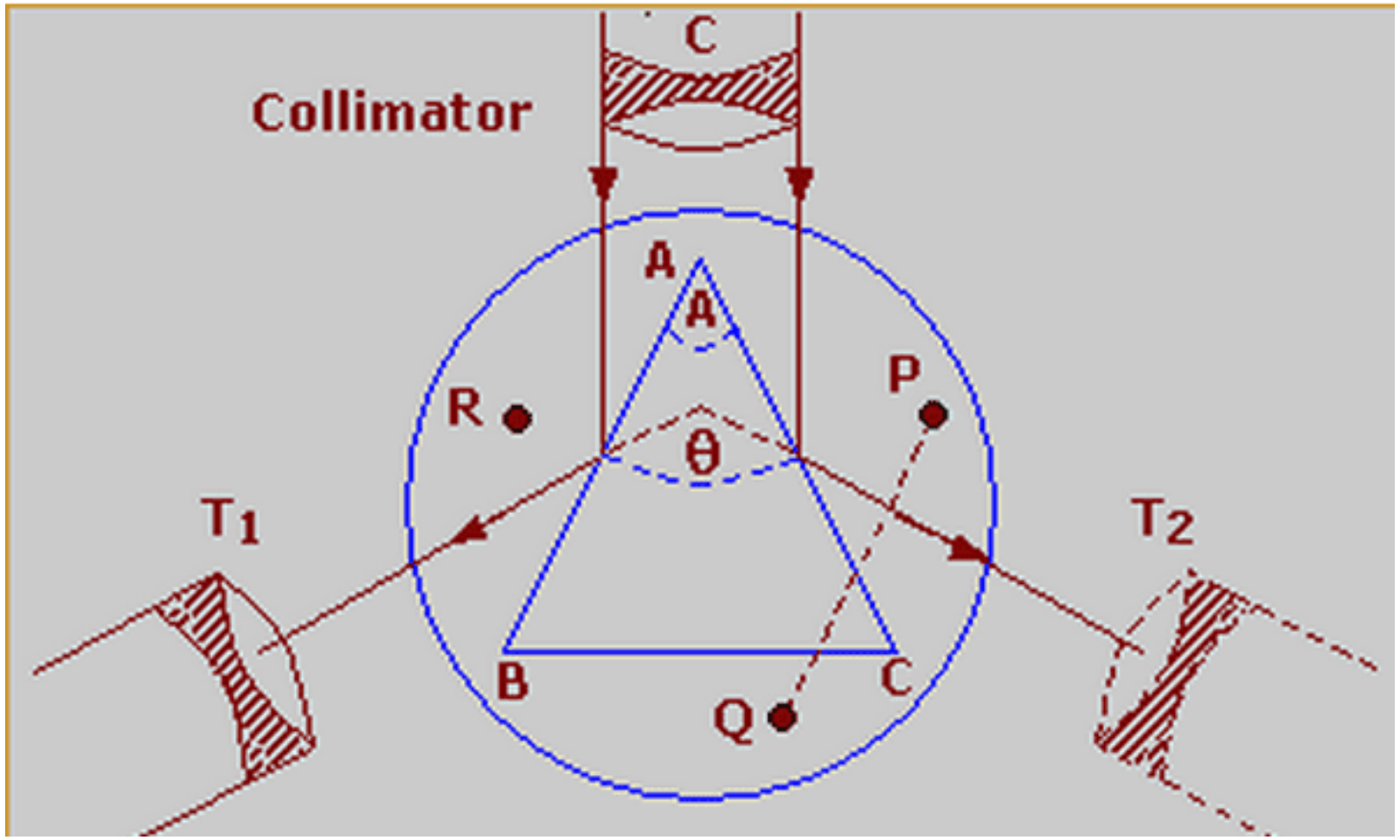
Theory:

•Light passing through a prism is refracted at its surfaces.

•Rotate the telescope to measure the angular deviation of light.

•The prism angle (AAA) is found using:

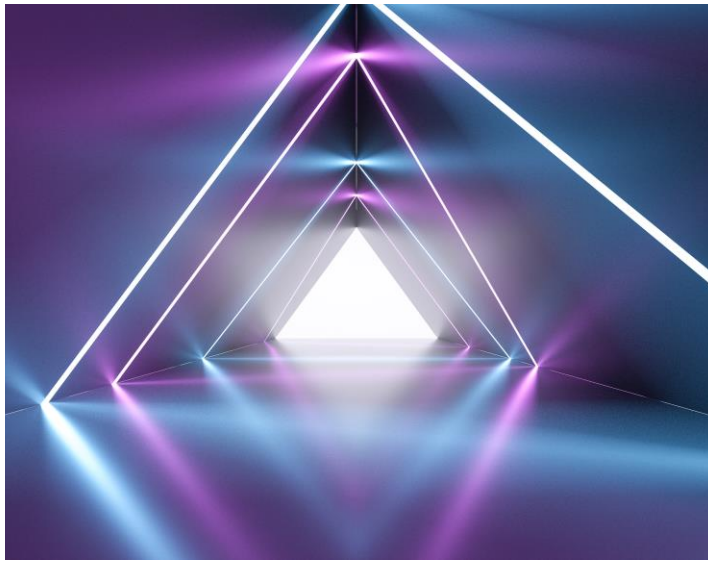
A=angle between the reflected rays from two faces of the prism.A = \text{angle between the reflected rays from two faces of the prism.}A=angle between the reflected rays from two faces of the prism.


C
Collimator
A
A
R
P
θ
T1
T2
B
C
Q

Procedure:

1. Place the prism on the spectrometer table.
2. Adjust the telescope and collimator for parallel light beams.
3. Direct the light ray onto one face of the prism.
4. Rotate the telescope to observe the reflected rays.
5. Measure the angle between the two reflected rays.
6. Record the observations.
7. Repeat the experiment to ensure accuracy.
8. Calculate the prism angle using the measured values.
9. Tabulate the data in an organized format.
10. Submit your observations and results.

Vernier number	Readings for image at the face AB of the prism				No. of observations	Readings for the image at the face AC of the prism				Difference in readings at the two faces ($\theta = M - N$)	Mean θ	Mean (θ) of the two verniers	Angle of the prism $A = \frac{\theta}{2}$
	Main scale reading (S)	Vernier scale divn. (V.D.)	Vernier scale reading $V = V.D. \times V.C.$	Total reading $M = S + V$		Main scale reading (S)	Vernier scale divn. (V.D.)	Vernier scale reading $V = V.D. \times V.C.$	Total reading $N = S + V$				
I	---	---	---	---	1	---	---	---	---	---			
	---	---	---	---	2	---	---	---	---	---	---		
	---	---	---	---	3	---	---	---	---	---		---	---
II					1								
					2						---		
					3								



5TH WEEK

Topic: To determine the refractive index of the material of a Prism

Experiment 4:

To determine the refractive index of the material of a Prism

Objective:

•To calculate the refractive index (n) of the material of a prism.

Apparatus:

Prism, spectrometer, Lamp, Crew Gauge, Magnifying Glass

Theory:

•At the angle of minimum deviation (Dm), the refractive index is given by

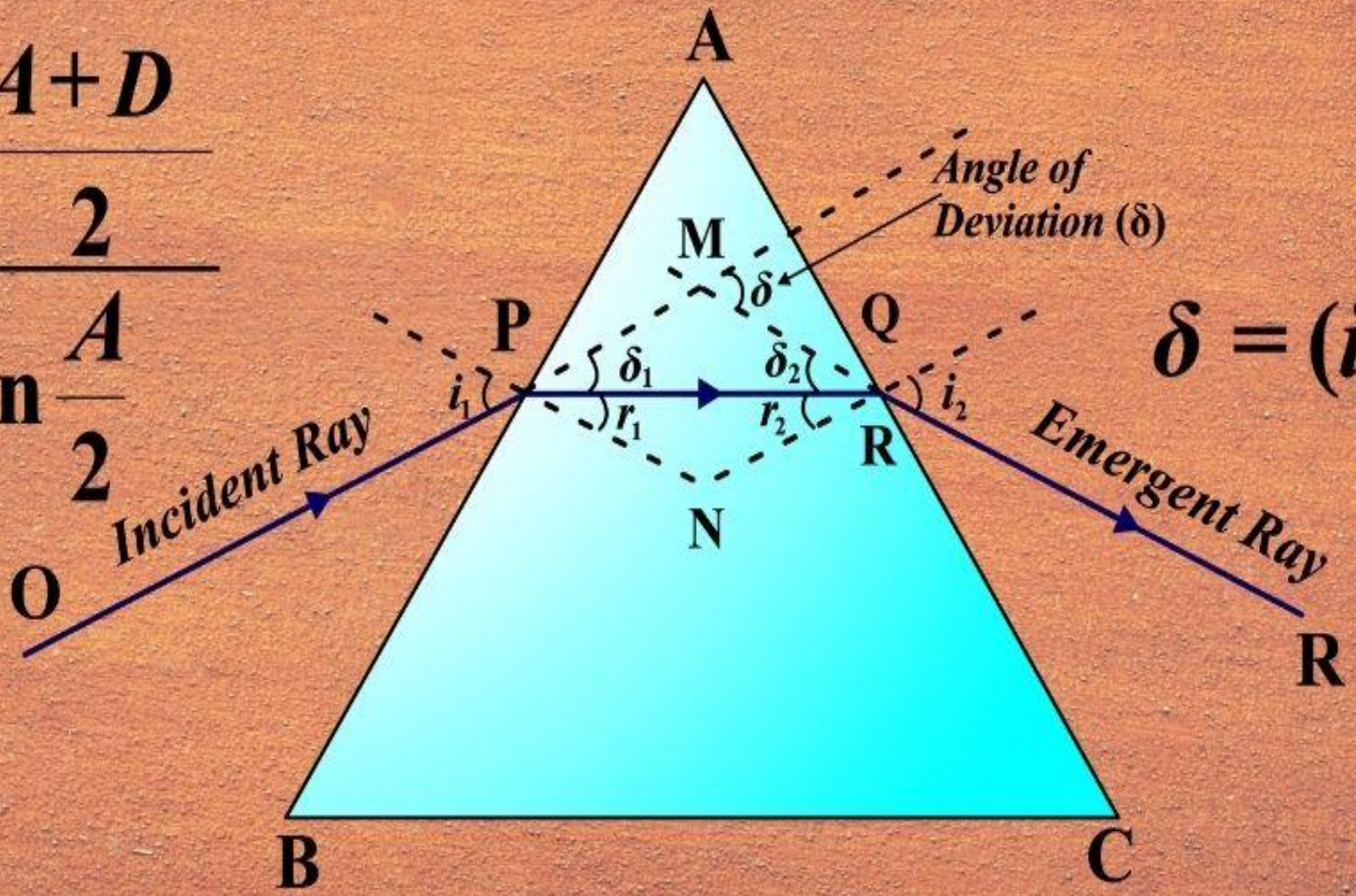
$$n = \frac{\sin((A + D_m)/2)}{\sin(A/2)}$$

•where A is the prism angle and Dm is the minimum deviation angle.

Refraction Through A Prism

$$\mu = \frac{\sin\frac{A+D}{2}}{\sin\frac{A}{2}}$$

$$\delta = (i_1 + i_2) - A$$



Procedure:

1. Place the prism on the spectrometer and align the collimator.
2. Direct light through the prism and find the minimum deviation angle (Dm).
3. Measure the angle of the prism (A) using reflected rays.
4. Record the angles carefully.
5. calculate the refractive index.
6. Repeat the experiment for different light sources.
7. Record all observations and measurements in a table.
8. Calculate the mean refractive index from multiple trials.
9. Draw the ray diagram for illustration.

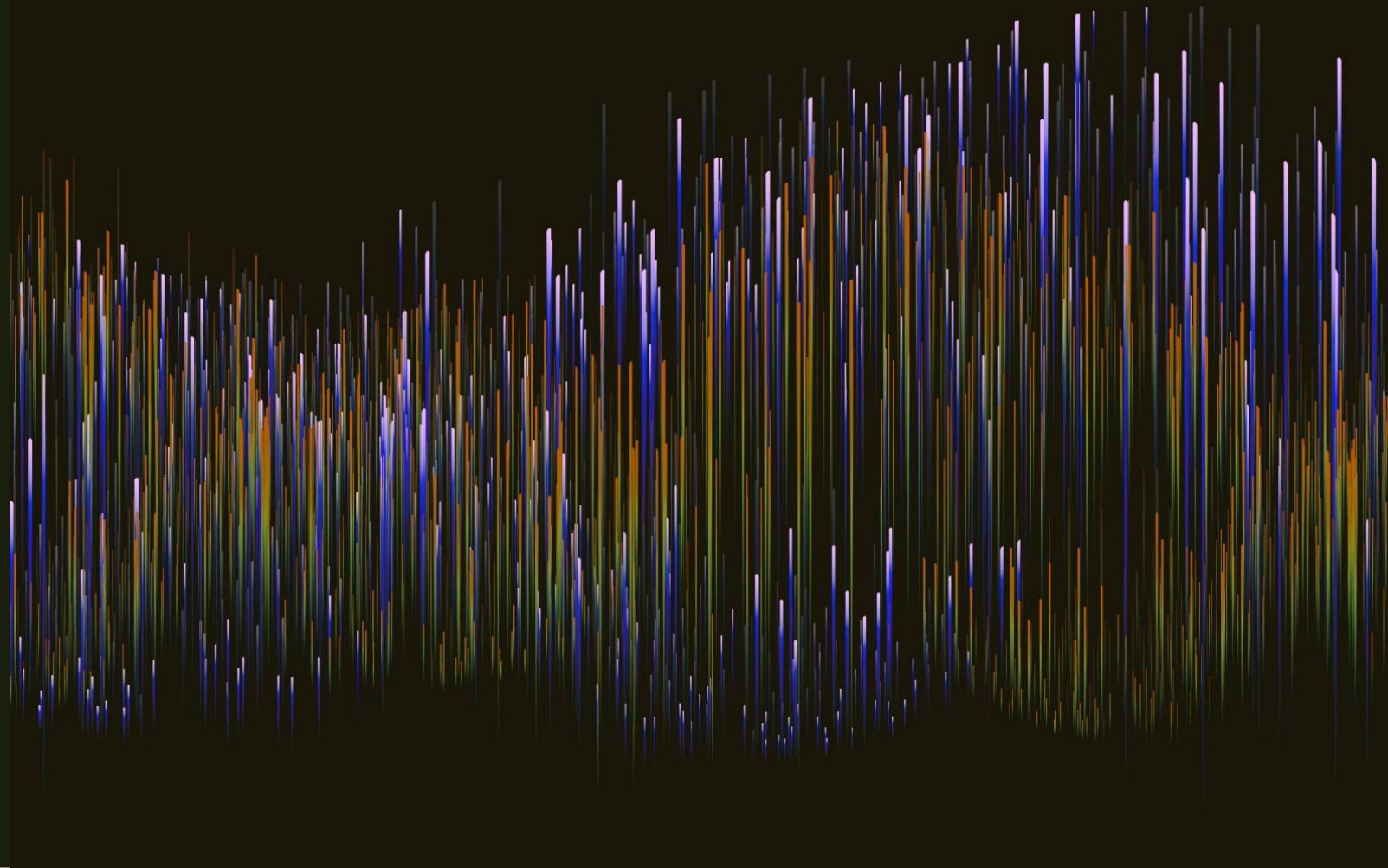
Write a detailed report including calculations and diagrams

(a) Table for angle of minimum deviation (δm).

Vernier number	No. of observations	Reading for the minimum deviation position					Reading for the direct position.					Angle of minimum deviation (δm)	Mean δm
		Main scale reading (S)	Vernier scale divn. (V.D.)	Vernier reading V=V.D. X V.C.	Total reading M=S+V	Mean M	Main scale reading (S)	Vernier scale divn. (V.D.)	Vernier scale reading V=V.D. X V.C	Total reading N=S+V	Mean N		
I	1	---	---	---	---		---	---	---	---			
	2	---	---	---	---	---	---	---	---	---	---	---	
	3	---	---	---	---		---	---	---	---			
II	1	---	---	---	---								
	2					---					---	---	
	3												

- 6th Week
- Topic:

To determine the wavelength of various spectral lines by the spectrometer is using a plane diffraction grating.



Experiment :05

To determine the wavelength of various spectral lines by the spectrometer is using a plane diffraction grating.

Objective:

- To measure the wavelength of spectral lines.

Apparatus:

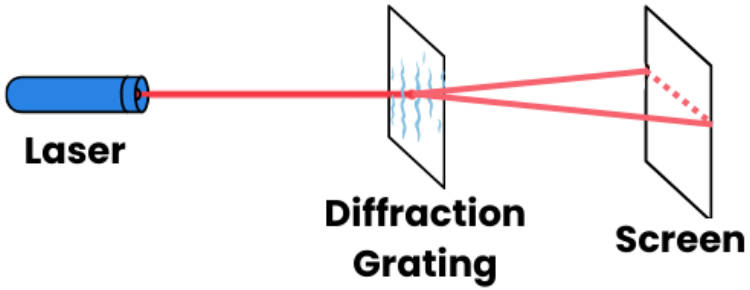
- Spectrometer, plane diffraction grating.

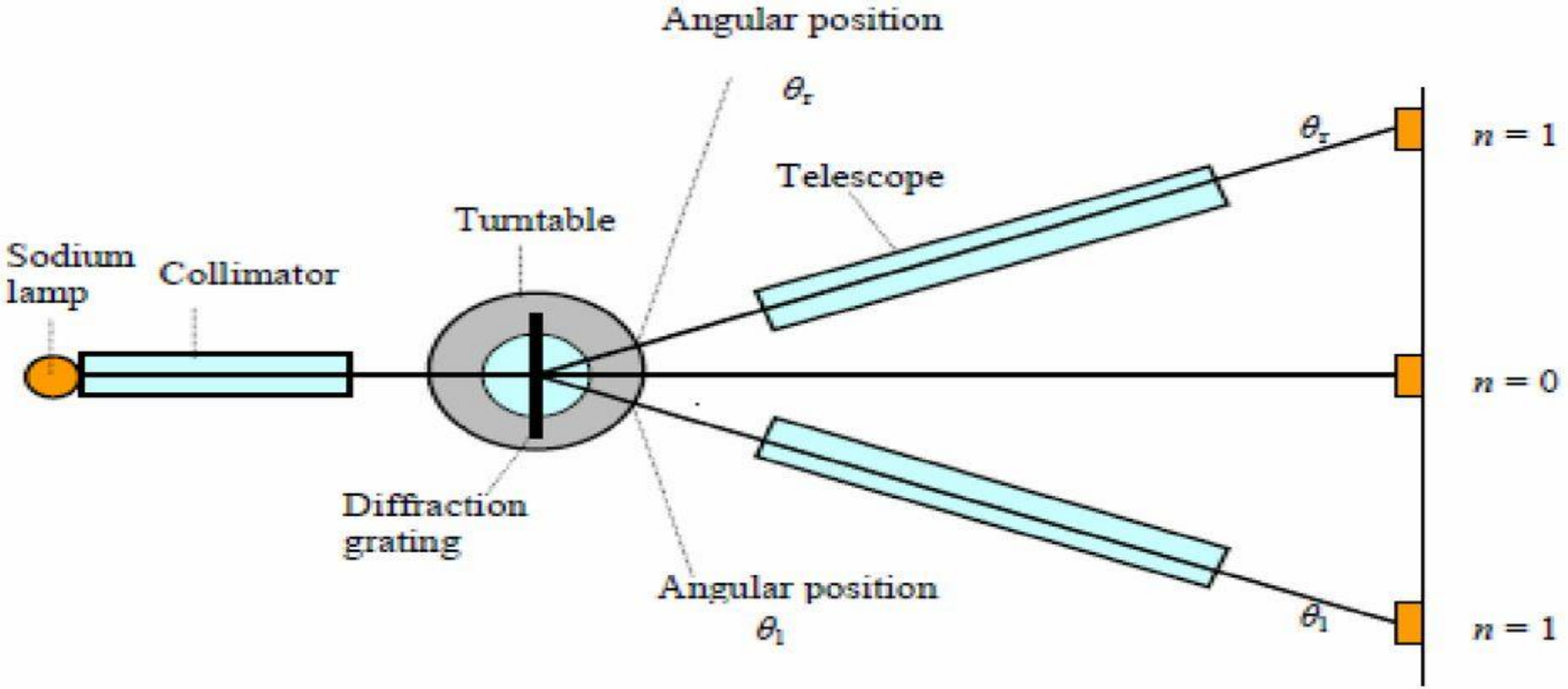
Theory:

- When light passes through a diffraction grating, it splits into spectral lines.
- Using the grating equation:

$$d\sin\theta = m\lambda$$

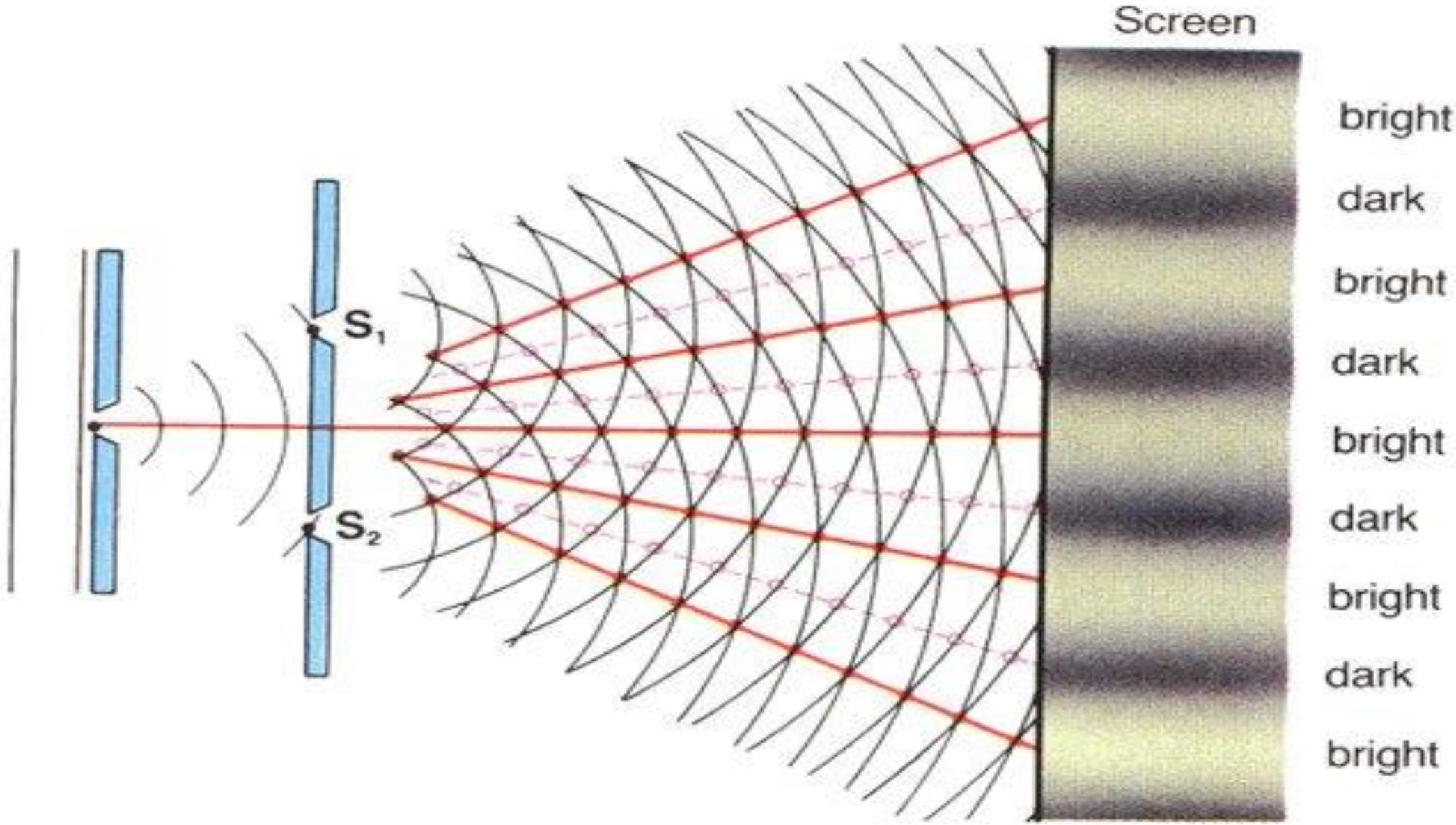
d = Spacing between adjacent lines on the grating.
θ = Angle of diffraction.
m = Order of the spectrum
λ = wavelength of the light.





The Spectrometer

Interference Patterns



Procedure:

1. Mount the diffraction grating on the spectrometer.
2. Align the collimator and telescope to view spectral lines.
3. Measure the angle of diffraction θfor the first and second orders.
4. Calculate the wavelength (λ) of each spectral line.
5. Repeat the procedure for different orders of diffraction.
6. Record all angles and corresponding wavelengths in a table.
7. Compute the average wavelength for each spectral line.
8. Compare results with known values.
9. Present findings in a tabulated report.

Table for the determination of the grating constant

Wave length (λ) A.U	Order number (n)	Reading for the angle of diffraction θ								2θ = A ~ B	θ	Grating constant $N = \frac{\sin\theta}{n\lambda}$	Mean grating constant
		Left side				Right side							
		Main scale reading (S)	Vernier reading (V)	Total = S + V	Mean reading (A)	Main scale reading (S)	Vernier reading (V)	Total = S + V	Mean reading (B)				
5890	1	...	...	...	...	...	...	...	...	...	...	...	
	2	...	...	...	...	...	...	...	...	...	...	...	
	etc.	...	...	...	...	...	...	...	...	...	...	...	
5896	1	...	...	...	...	...	...	...	...	...	...	...	
	2	...	...	...	...	...	...	...	...	...	...	...	
	etc.	...	...	...	...	...	...	...	...	...	...	...	

7th Week

Topic:

To determine the specific heat of a liquid by the cooling method.

Experiment 06:

To determine the specific heat of a liquid by the cooling method

Objective:

- To calculate the specific heat (ccc) of a liquid.

Apparatus:

- Calorimeter, thermometer, stopwatch, liquid sample.

Theory:

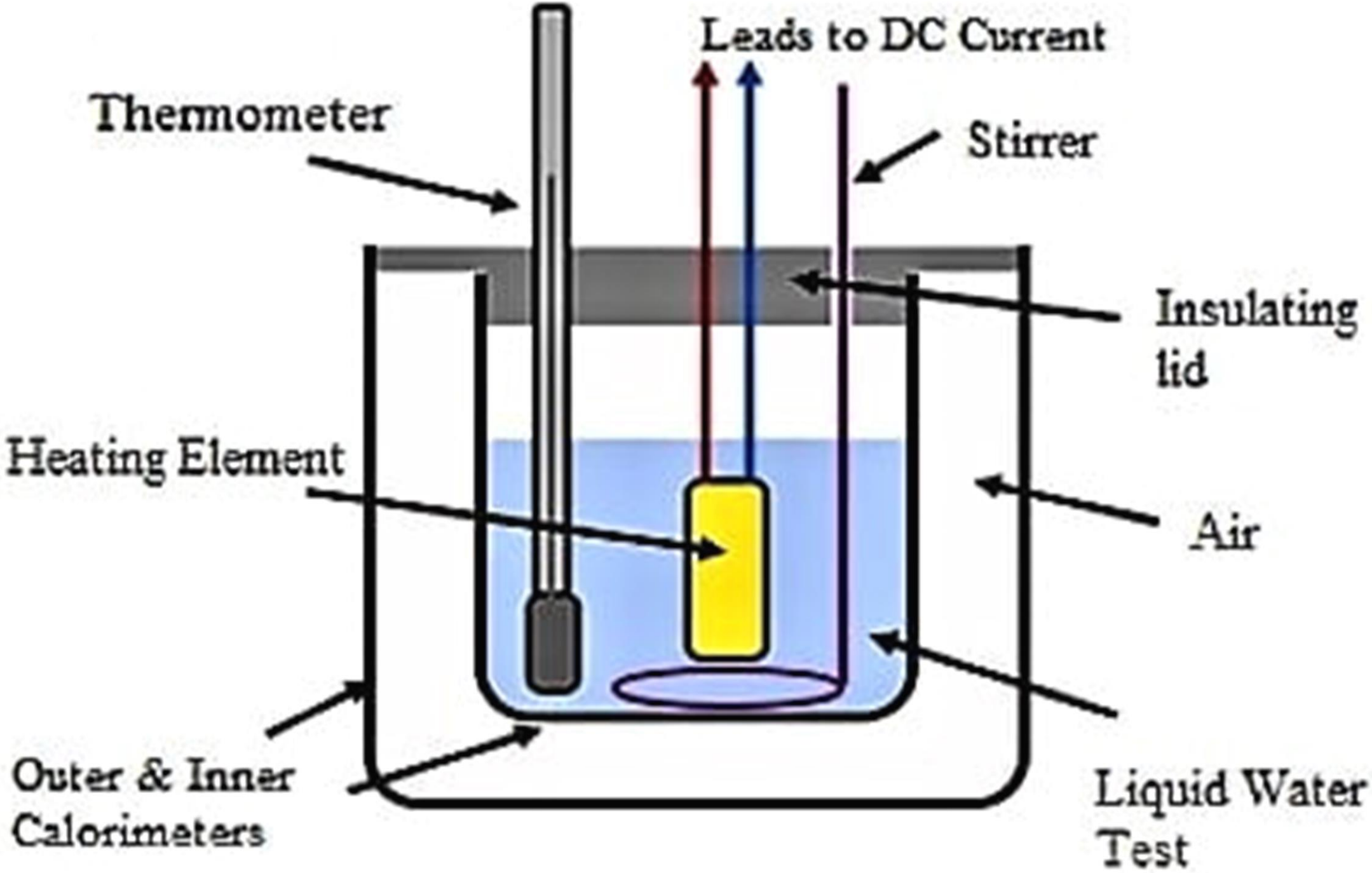
- Using Newton's law of cooling, monitor the temperature change over time:

$$Q = m\,c\,\Delta T$$

Q = Heat (cal or J)
m = Mass (g)
c = Specific heat (J/g°K)
ΔT = Change in temperature

If Q is **positive**, the substance **absorbed** heat.
If Q is **negative**, the substance **released** heat.

1 cal = 4.18 J
1000 cal = 1 kcal
0 °C = 273 K


Leads to DC Current
Thermometer
Stirrer
Insulating lid
Heating Element
Air
Outer & Inner Calorimeters
Liquid Water Test

Procedure:

1. Fill the calorimeter with the liquid whose specific heat is to be measured.
2. Measure the initial temperature of the liquid.
3. Allow the liquid to cool in a controlled environment.
4. Record the temperature at regular time intervals.
5. Use Newton’s law of cooling to calculate heat loss.
6. Plot a graph of temperature vs. time to find the rate of cooling.
7. Calculate the specific heat using $Q=mc\Delta T$
8. Repeat the process for different liquids if required.
9. Compare calculated values with standard values.
10. Document observations, graphs, and results.

Table

Time in minutes	1	2	3	4	5	6	7	8	etc
Temp. of water in °c									
Temp. of liquid in°C									

8th Week

Topic:

To determine the value of J, the mechanical equivalent of heat by electrical method

Experiment Name 07:

To determine the value of J, the mechanical equivalent of heat by electrical method.

Objective:

- To determine J, the mechanical equivalent of heat.

Apparatus:

- Electrical heating coil, calorimeter, thermometer, power supply.

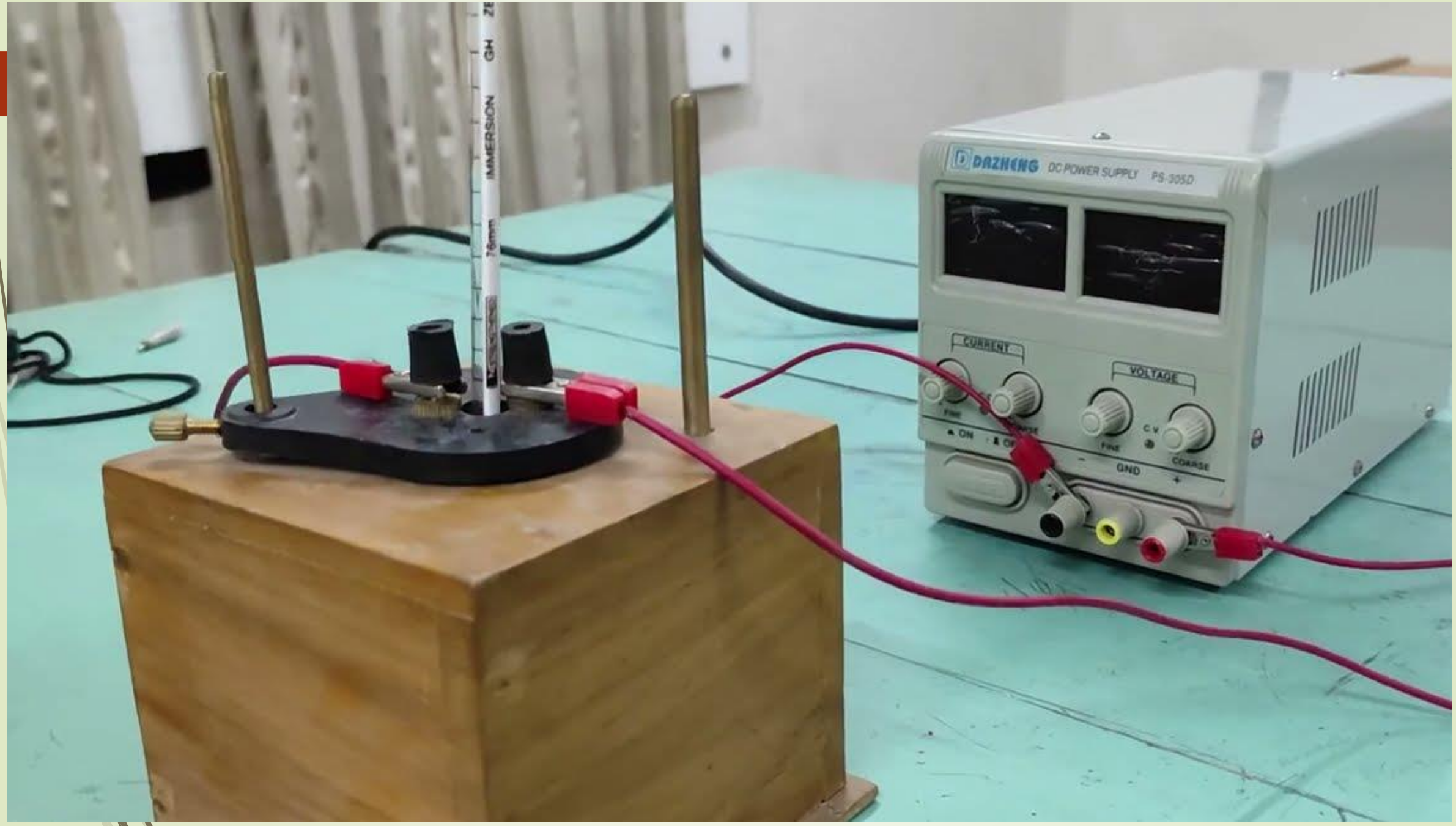
Theory:

Heat energy is related to electrical energy by

$$Q = I^2Rt$$

$$J = \frac{Q}{W}$$

where I = current, R = resistance, t = time, and W = work done.


IMMERSION
DAZHENG
DC POWER SUPPLY
PS-305D
CURRENT
VOLTAGE
FINE
COARSE
GND
C.V

Procedure:

1. Set up the electrical heating coil inside the calorimeter filled with water.
2. Measure the initial temperature of the water.
3. Connect the heating coil to the power supply.
4. Measure the current (I), resistance (R), and time (t) accurately.
5. Record the final temperature of the water.
6. Perform multiple trials for accuracy.
7. Tabulate observations and results.

(B) Current-Voltage Record :

No. of obs.	Time minutes	Current i amp.	Voltage E volts	Temperature °C
1	0	...	...	28°C (say)
2	1			
3	2			
.	.			
.	.			
.	.			
.	.			
.	.			
11	10(t)	current stopped (say)		37. 8°C (say)
12	11			38°C (say) max
13	22			36°C (say)

9th Week

Topic:

To find the variation of the frequency of A tuning fork with the length of a sonometer (n-l curve) under given tension and hence to determine the unknown frequency of A tuning fork.

Experiment 08:

To find the variation of the frequency of A tuning fork with the length of a sonometer (n-l curve) under given tension and hence to determine the unknown frequency of A tuning fork

Objective:

To study the relationship between the frequency (n) and length (l) of a vibrating string.

Apparatus:

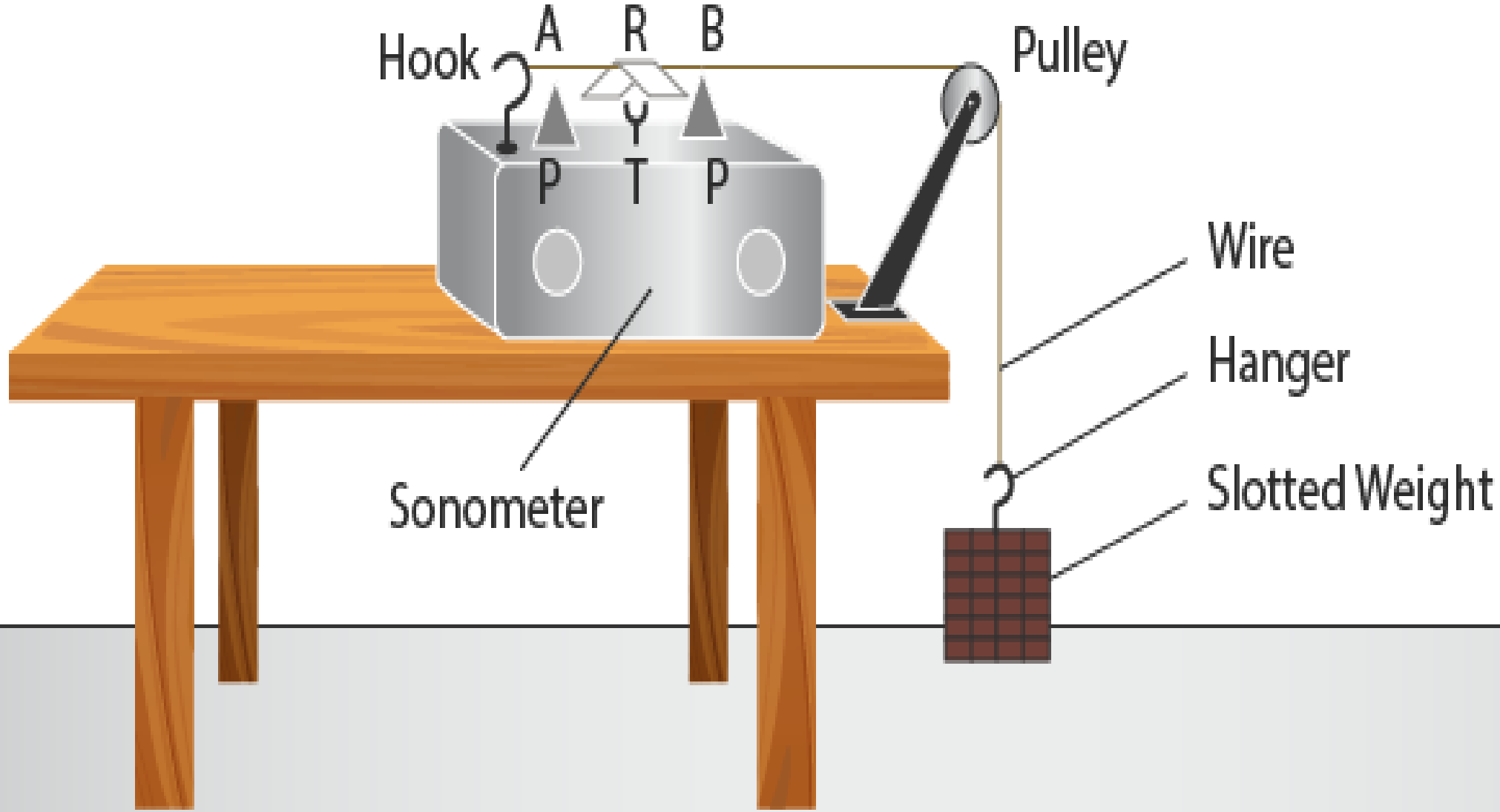
Sonometer, tuning forks, weights.

Theory:

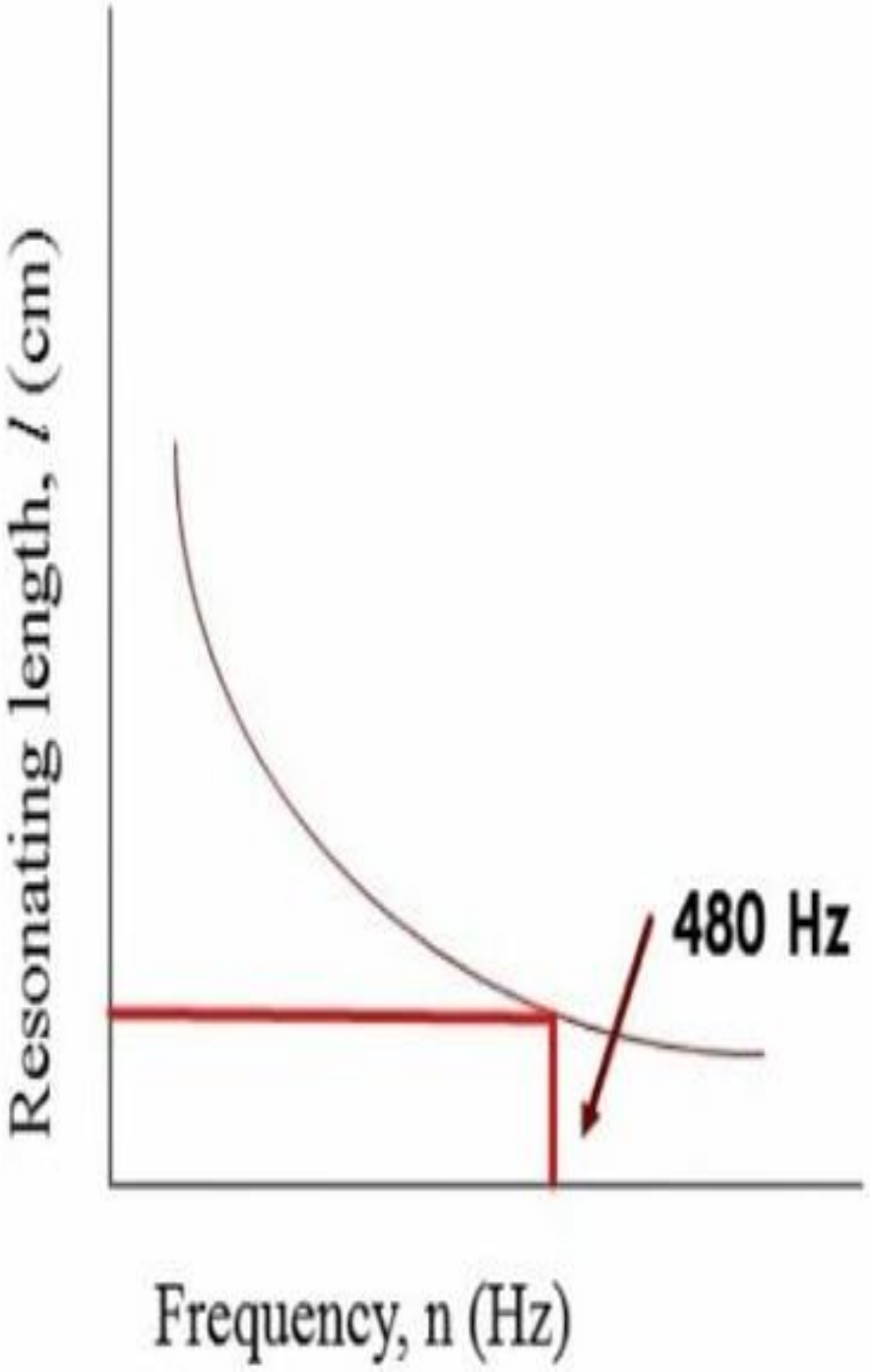
The fundamental frequency is related to length by:

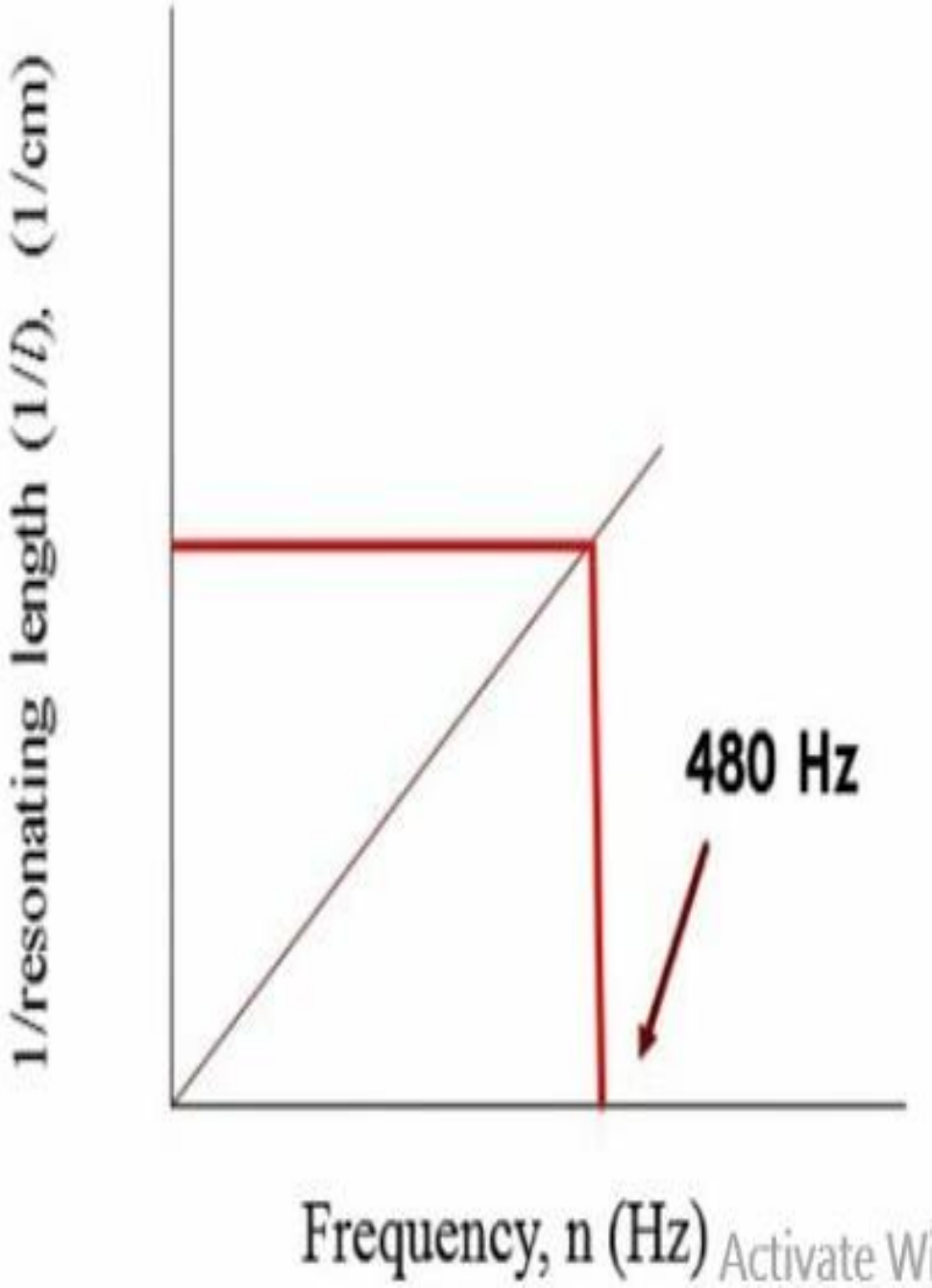
$n \propto 1/l$

Find the unknown frequency by plotting the $n-l$n curve.



Sonometer in experimental set up


Resonating length, l (cm)
480 Hz
Frequency, n (Hz)


1/resonating length (1/l), (1/cm)
480 Hz
Frequency, n (Hz)

Procedure:

1. Place the sonometer on a stable table and attach the wire.
2. Apply tension using weights.
3. Strike the tuning fork and place it on the sonometer to induce vibration.
4. Adjust the wire length until resonance occurs.
5. Measure the length of the vibrating wire.
6. Record the frequency of the tuning fork.
7. Plot the frequency (n) vs. length (l) graph.
8. Use the graph to calculate unknown frequencies.
9. Repeat for different tuning forks and tensions.
10. Submit a report with graphs and observations.

Results :

Stretching weight of the wire, M=... ... ...gm.

No.of obs.	Frequency n	Resonating length in cm	mean resonating length (l)	$\frac{1}{l}$	nl = const
1	...	...	...	...	...
2	...	...	...	...	...
3	...	...	...	...	...
4	...	...	...	...	...
5	...	...	...	...	...
6	unknown	...	...	...	...

10th Week

Topic:

To determine the velocity of sound by acoustic transducer.

Experiment 09:

To determine the velocity of sound by acoustic transducer.

Objective:

•To measure the velocity of sound in air.

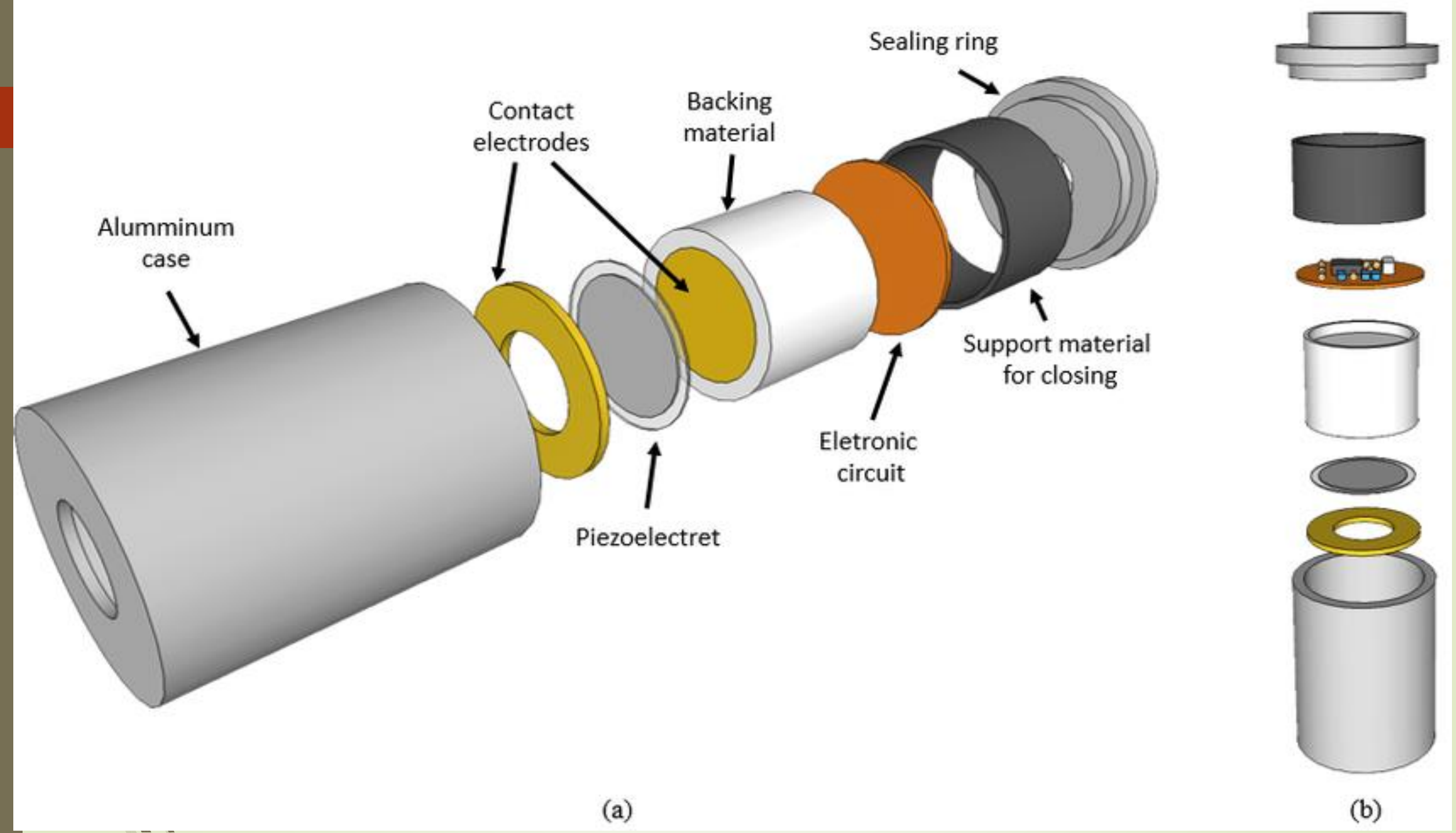
Apparatus:

•Acoustic transducer, microphone, frequency generator.

Theory:

•Use the relation: $v=f\lambda$

•Measure the frequency (F) and wavelength (λ) using the acoustic setup.


Sealing ring
Contact electrodes
Backing material
Alumminum case
Support material for closing
Eletronic circuit
Piezoelectret
(a)
(b)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Procedure:

1. Set up the acoustic transducer and microphone.
2. Generate sound waves of known frequencies.
3. Measure the distance between successive nodes or antinodes.
4. Record the wavelength (λ) of the sound waves.
5. Calculate the velocity using $v=f\lambda$.
6. Repeat the process for different frequencies.
7. Tabulate the frequencies, wavelengths, and velocities.
8. Compare calculated velocity with the standard value.
9. Discuss sources of error and ways to minimize them.

Present findings in a detailed report.

Results :

No of obs.	Frequency in Hz	Length l. in metre	Pulse height
1 2 3 . . . etc.			

11th Week

Topic:

To determine a minimum angle of deviation of a prism by pin method.

Experiment 10: To determine a minimum angle of deviation of a prism by pin method.

Objective:

To determine the minimum angle of deviation of a prism and to calculate the refractive index of the material of the prism using the pin method.

Apparatus:

- Prism, Drawing board, Light source (e.g., laser pointer or lamp), Protractor, Pins, Ruler, Spectrometer (optional)

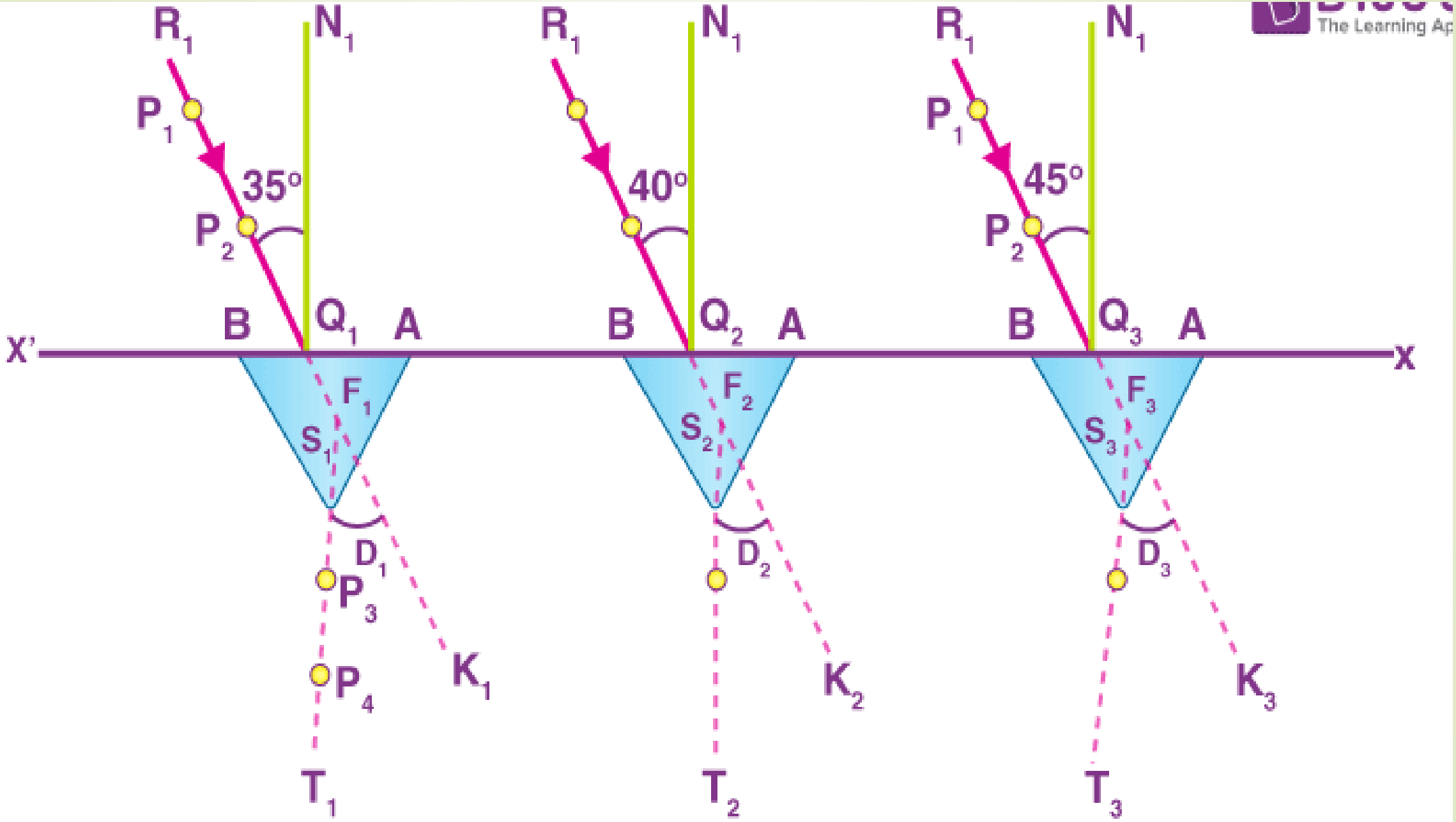
Theory:

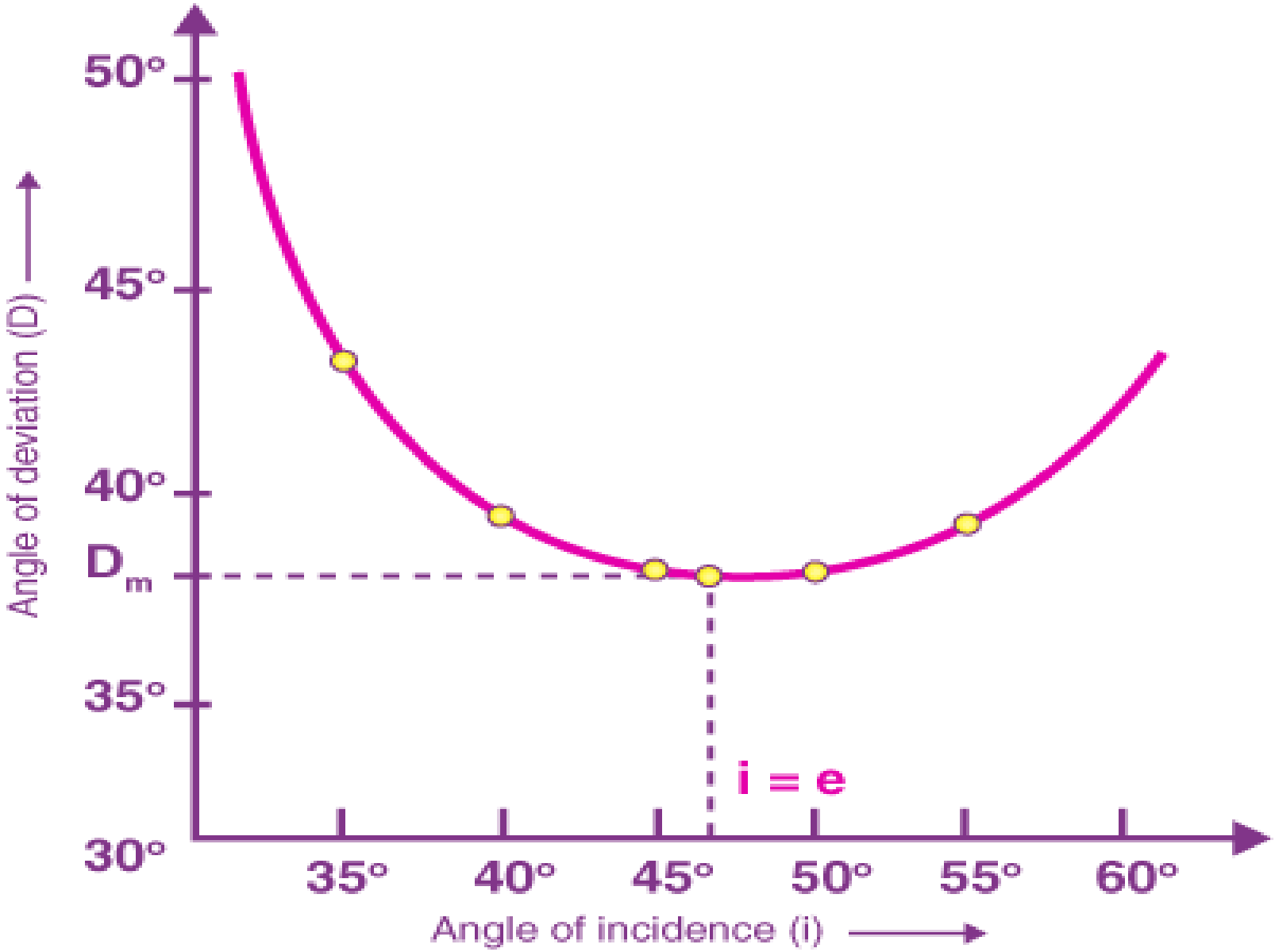
When a light ray passes through a prism, it refracts at both the entry and exit surfaces. The total deviation (D) of the light ray depends on the angle of incidence, the angle of the prism, and the refractive index of the material. The minimum deviation is achieved when the ray passes symmetrically through the prism, where the angles of incidence and emergence are equal.

At the minimum angle of deviation, the relationship between the refractive index (n) and the prism angle (AA) can be expressed as:

Where:

- n = refractive index of the prism material
- A = angle of the prism
- Dmin = minimum angle of deviation


R1
N1
P1
35°
P2
B
Q1
A
X'
X
F1
S1
D1
P3
P4
K1
T1
R1
N1
40°
B
Q2
A
F2
S2
D2
K2
T2
R1
N1
P1
45°
P2
B
Q3
A
F3
S3
D3
K3
T3



Graph between i and D

Procedure:

1. Place the prism on a drawing board and ensure it is stable. Fix the prism using pins or a holder.
2. Set up the light source, such as a laser pointer, and direct the light beam onto one face of the prism.
3. Place a pin at the point where the incident light ray hits the surface of the prism. This is the starting point of the light.
4. Trace the path of the emergent ray by placing another pin at the point where the light exits the prism.
5. Rotate the prism slowly to adjust the angle, while observing the change in the direction of the emergent ray.
6. Identify the position where the deviation is minimized, which occurs when the incident and emergent rays are parallel.
7. Mark the positions of the incident and emergent rays at minimum deviation with additional pins.
8. Measure the angle of incidence (iii) and the angle of emergence (e) formed by the rays using a protractor.
9. Measure the angle of the prism (AAA) using the protractor.
10. Calculate the minimum angle of deviation (Dmin) by finding the difference between the angles of incidence and emergence.

Use the formula to calculate the refractive index (n) of the material of the prism

S. No.	Angle of Incidence (i)°	Angle of Emergence (e)°	Angle of Deviation (D)°	Minimum Deviation (D_{min})°

11, 12, 13, 14, 16, 17th Weeks are Covered by Review class, Practice Class and Final Exam

Any Question ?

The End


thank you
danke
謝謝
рахмат
ngiyabonga
شكراً جزيلاً
teşekkür ederim
Баярлалаа
спасибо
faafetai lava
dank je
gracias
tapadh leat
хвала
asante
manana
obrigada
tenki
murakoze
chokrane
mochchakkeram
djiere dieuf
tau
мерси
merci
obrigado
bedankt
dziękuję
hvala
mauruuru
kiitos
dankie
dhanyavad
nanni
nandri
bayarlalaa
gràcie
köszönöm
enkosi
akun
dankon
aciu
vinaka
спасибі
blagodaram
misaotra
matondo
paldies
grazzi
mahalo
barka
welalin
tack
kia ora
mersi
spas
chnorakaloutioun
gratias ago
grācies
sulpáy
дякую
mamnun
go raibh maith agat
sukriya
kop khun krap
taiku
sagolun
sobodi
dēkuji
mesi
didi madloba
najis tuke
terima kasih
kam sah hamnida
rahmat
তোমাকে ধন্যবাদ
감사합니다
ありがとう
tanemirt
rahmet
grazie
arigatô
takk
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trugarez
shukriya
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xièxie
ευχαριστώ