★ Applied Physics ★ 2020 BATCH ★

Experiment Name / No.:

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★ Vision and Mission ★

Of Applied Physics ★

1) Vision :-> Consolidating teaching and learning process covering all aspects of pure and applied physics that promotes research and development leading to creation of new knowledge, inventions and discoveries fostering institute-industry linkages and entrepreneurial culture for betterment of all its stake holders and society at large.....99

2) Mission :->

M1 :-> To establish global and industry standards of excellence by generating new knowledge in all the endeavours concerned to teaching.

M2 :-> To develop close linkages with students industry to undertake collaborative projects so as to enable young engineers

M3 :-> To help our students in developing human potentials, intellectual interests, creative abilities and be life long learners to meet

Students' Sign

the challenges of the national and global environment and be true professional leaders.

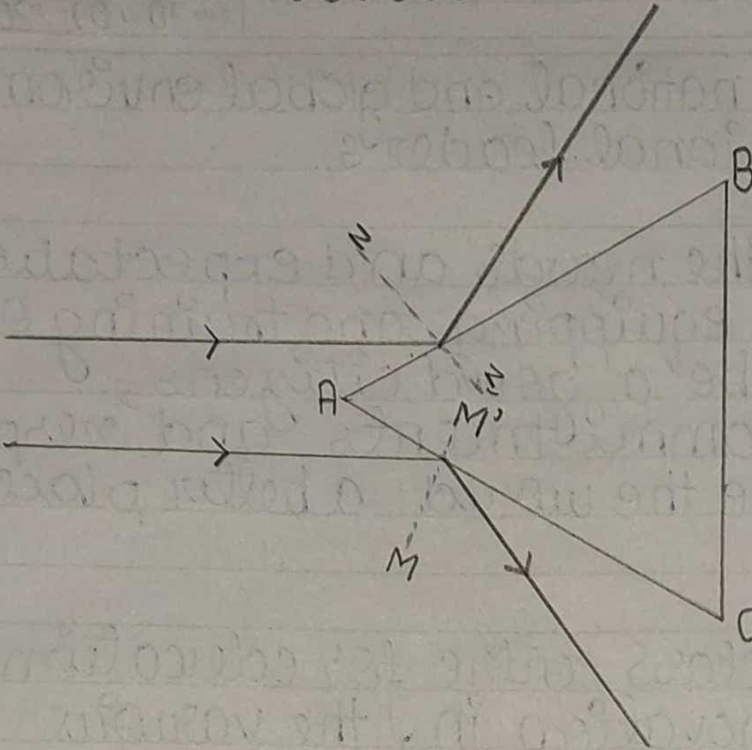
M4> To stand up to the needs and expectations of our society by equipping and training our students to be a good citizens, aware of their commitments and responsibilities, to make the world a better place to live.

M5> To be a world class centre for education, research and innovation in the various upcoming fields of Applied Physics

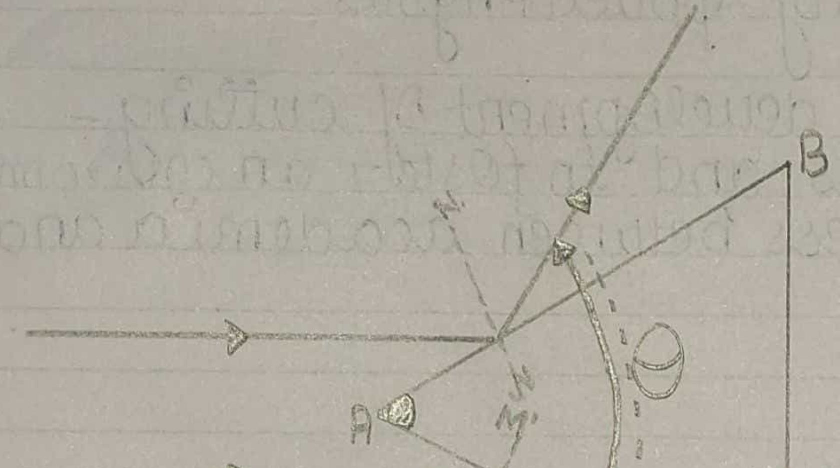
M6> To focus on the development of cutting-edge technologies and to foster an environment of seamlessness between academia and industry

Student's Signature

(Experiment No:-> 1)



(fig 1)
(showing reflection from the two edges of the prism)



(fig 2)

signature

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Experiment no:-01.

1) Aim:-> To measure the angle of Prism using Spectrometer.

2) Apparatus Required:->

⇒ Spectrometer, a Glass Prism, Sodium Lamp, Spirit Level, a magnifying glass

3) Formula Used:-> 1) Total Reading = M.S.R + (L.C * V.S.R) in degrees.
2) $A = \theta/2$

⇒ M.S.R = Main scale Reading
L.C = Least count of the Instrument
V.S.R = Vernier scale Reading

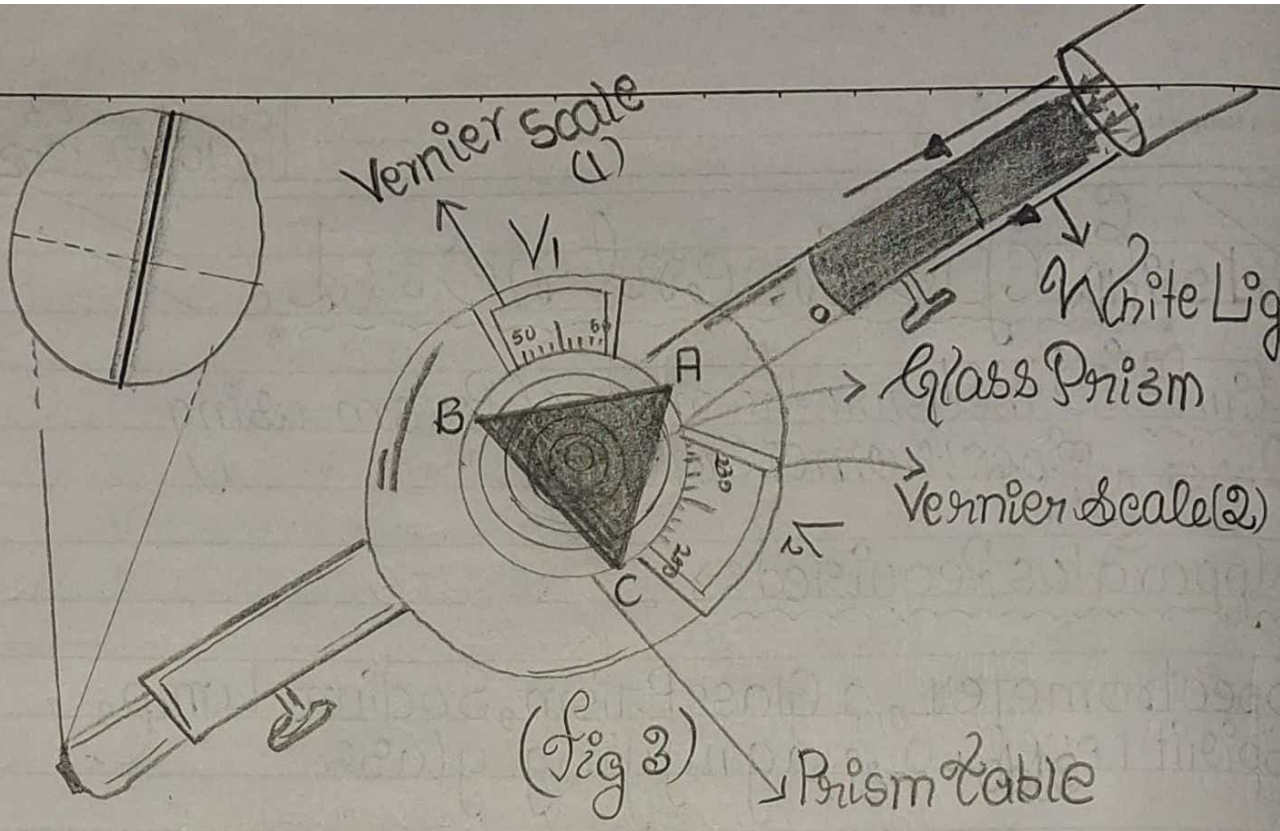
4) Theory:->

Angle of Prism (A) is the angle between the two refracting edges of the prism.

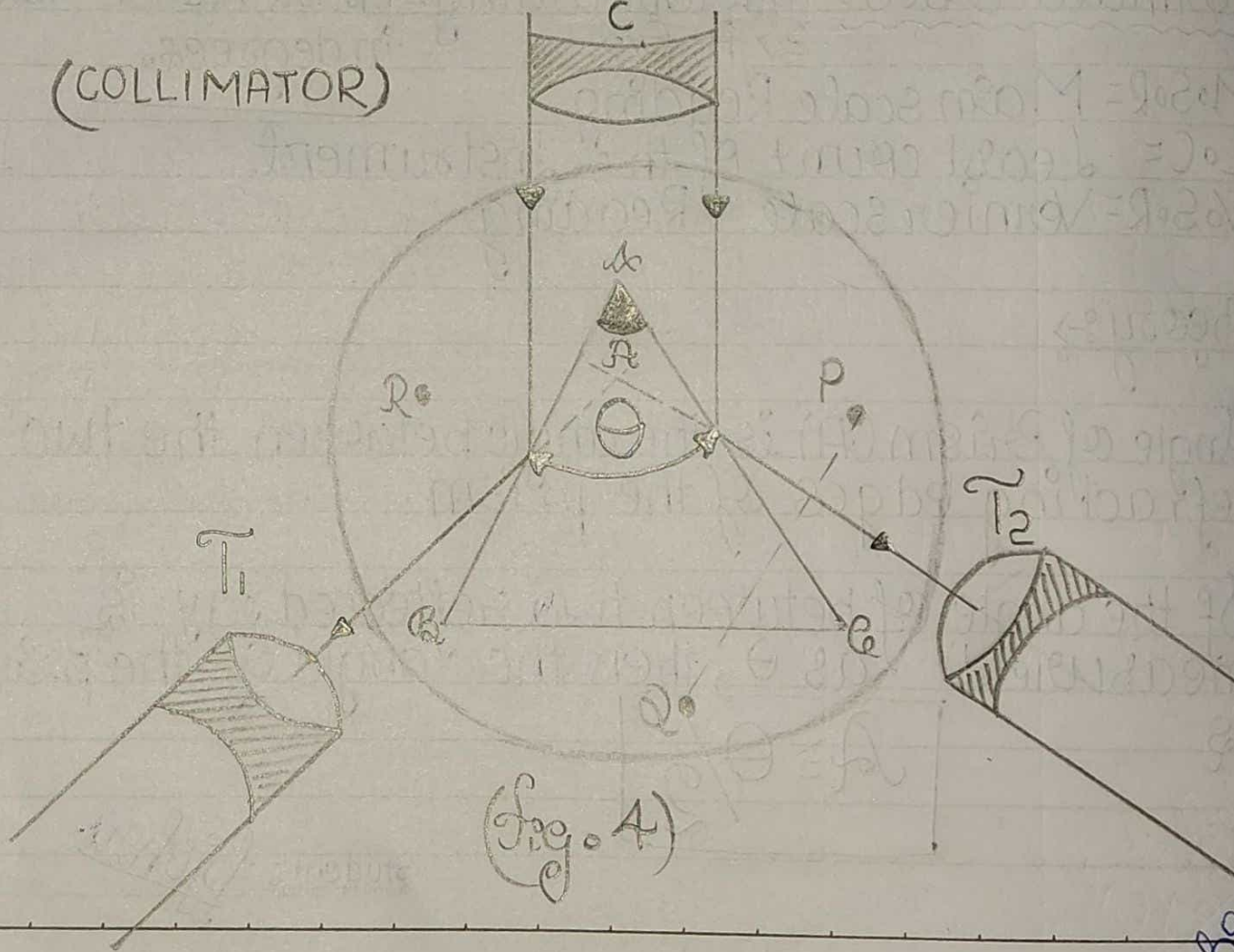
* If the angle of between two reflected ray is measured as θ, then the angle of the prism is

$$\boxed{A = \theta/2}$$

Student's / Teacher's Signature: Vidhi


Vernier Scale (1)
V1
White Light
Glass Prism
Vernier Scale (2)
A
B
C
Prism Table

(Fig 3)


(COLLIMATOR)
C
A
R
P
Q
T1
T2

(Fig. 4)

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Spectrometer

☆ The spectrometer is an instrument used for analyzing the spectra of radiations

☆ The white light is rendered parallel by a collimator consisting of a tube with a slit of adjustable width at one end and a convex lens at the other

☆ The collimator has to be focussed by adjusting the position of the slit until it is at the focal point of the lens

☆ The parallel beam of light from the collimator passes through a glass prism standing on a prism-table which can be rotated or lowered and levelled

☆ The prism deviates the component colors of the emitted light by different amounts and the spectrum so produced is examined by means of a telescope, which is mounted on a rotating arm and moves over a divided angular scale

☆ The telescope should be set by focussing on a distant object

Teacher's Signature: Rohini

Least count of the Spectrometer = $\left(\frac{1}{60}\right)^\circ$ = 1 minute = 1'

Observations :->

1.) Rays of White light are parallel through collimator
2.) Bending Angle of Prism should be 60°.

Observation Table :->

S.No.		Light reflected from side AB of prism (in degrees) Total = MSR + (VSR × L.C)			Light reflected from side AC of prism Total = MSR + (LC × VSR) (in degrees)			Difference between TWO positions (2A)	Angle of Prism (A)
		MSR	VSR	Total	MSR	VSR	Total		
1	V_1	70	20	70.33	310	20	310.33	120.00	60.000
	V_2	250	19	250.316	130	9	130.15	120.16	60.083
2	V_1	70	20	70.33	310	18	310.3	120.03	60.015
	V_2	250	19	250.316	130	17	130.28	120.036	60.018
3	V_1	70	10	70.16	310	20	310.33	119.83	59.915
	V_2	250	9	250.15	130	9	130.15	120.00	60.00

Pichoie

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☆ Least Count of the Spectrometer ☆

Least count of an instrument gives the minimum measurement that can be taken from that instrument.

$$\text{Least count of Spectrometer} = \frac{[1\ \text{M.S.D}]}{\text{No. of divisions on Vernier Scale}}$$

As,
$$20\ \text{M.S.D.} = 10^\circ$$

So,
$$1\ \text{M.S.D} = \left[\frac{10}{20}\right]^\circ$$

No of divisions on vernier scale = 30

$$\text{Least Count} = \left(\frac{1}{60}\right)^\circ = \underline{1\ \text{minute}}$$

Teacher's Signature: Pathore

Calculations :-

$$\text{Mean} = \frac{\text{Sum of all set of values}}{\text{No of values}}$$

$$= \frac{(60.000 + 60.083 + 60.015 + 60.018 + 59.915 + 60.00)}{6}$$

$$= \frac{360.031}{6}$$

$$= 60.005166 \simeq 60.005^{\circ}$$

Mean (A) = 60.005°

Result :- The Angle of Given Prism by using Spectrometer comes out to be (60.005°)

Jyothi

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5.) Result :- The Angle of Given Prism (A) by using Spectrometer comes out to be {60.005°} Ans

6.) Percentage error :-

$$= \left[\frac{\text{Measured value} - \text{Exact value}}{\text{Exact value}}\right] \times 100\%$$

$$= \left(\frac{60.005^\circ - 60.000^\circ}{60.000^\circ}\right) \times 100\%$$

$$= 0.00833\%$$

7.) Precautions and Sources of Error :-

1.) Light coming from the slit should be narrow & bright

2.) Telescope must be focussed

3.) Readings of the vernier scale should be taken carefully

4.) Prism table should be levelled with a spirit level before placing prism

Teacher's Signature: Bishnu