AIM :

To determine the refractive index of the glass prism using a spectrometer

APPARATUS REQUIRED :

Spectrometer, spirit level, magnifying glass, glass prism, sodium vapour lamp
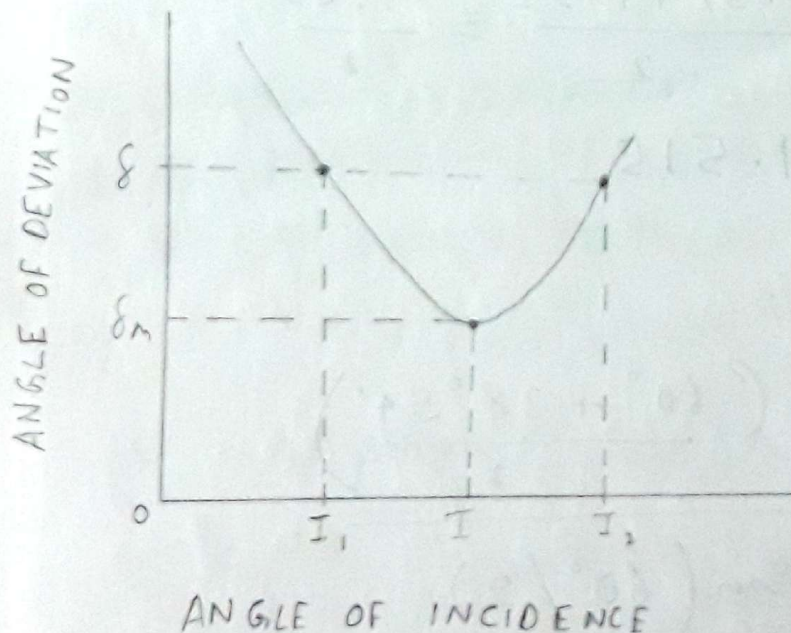
FORMULA :

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

where μ = Refractive Index

A = Angle of prism

δ_m = Angle of minimum deviation

DIAGRAM :

OBSERVATION TABLE

Least count = $\dfrac{\text{Length of 1 division of MS}}{\text{No. of divisions, vernier scale}}$ = $\dfrac{30'}{30} = 1'$

Angle of prism, A (as obtained earlier) = $60°$

Vernier	Reading for minimum deviation position (R₁)			Reading for direct ray (R₂)			$\delta_m = R_1 - R_2$	μ
	MSR (deg)	VSR (min)	TR (min)	MSR (deg)	VSR (min)	TR (min)		
A	$162°$	$0'$	$162°0'$	$123°$	$6'$	$123°6'$	$38.54'$	1.51
B	$342°$	$4'$	$342°4'$	$303°$	$2'$	$303°2'$	$39.2'$	1.52

Average $\mu = \dfrac{1.51 + 1.52}{2} = \dfrac{3.03}{2}$

$= 1.515$

CALCULATIONS:

A: $\mu = \dfrac{\sin\left(\dfrac{60° + 38°54'}{2}\right)}{\sin\left(60°/2\right)}$

$= 2 \sin\left(\dfrac{98°54'}{2}\right)$

$= 1.51$

Scanned by CamScanner

B: $\mu = \dfrac{\sin\left(\dfrac{60 + 39°2'}{2}\right)}{\sin\left(\dfrac{60}{2}\right)}$

$= 2 \sin(49.51)$

$= 1.52$

L.C
denvan

RESULT :

The Refractive Index of the given glass prism is : 1.515