EXPERIMENT NO : 12

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

Apparatus : A glass slab, travelling microscope, Lycopodium powder.

Theory : The refractive index of the glass slab is given by,

$$n = \frac{Real\ \ dept\,h\ of\ \ slab}{Apparent\ \ \ dept\,h\ of\ \ slab}$$

Procedure :

1. Place the travelling microscope near the window so that sufficient light is available.
2. Adjust the leveling screws so that the base of the microscope becomes horizontal.
3. Find the least count of the vertical scale and note the same.
4. Make a small black/blue dot on the base of the microscope.
5. Make the microscope vertical , in line with the dot and focus so that the dot is clearly visible when viewed through the eye-piece.
6. Take the main scale and vernier scale readings from the vertical scale (R_1).
7. Place a glass slab over the dot on the base.
8. Raise the microscope upwards slowly viewing through the eye-piece. Fix the microscope when the dot is again seen clearly.
9. Note the reading from the vertical scale (R_2).
10. Sprinkle some lycopodium powder on the surface of the slab.
11. Again raise the microscope and fix it when the powder is seen clearly though the eye-piece.
12. Note the reading (R_3).
13. Repeat the above steps for a different glass slab.

Result : The refractive index of the material of the glass slab is _____

Precautions :

1. The parallax should be properly removed.
2. The microscope should be moved in upward direction only to avoid back lash error.

Sources of error :

1. The dot is not focused properly.
2. The microscope scale may not be properly calibrated.

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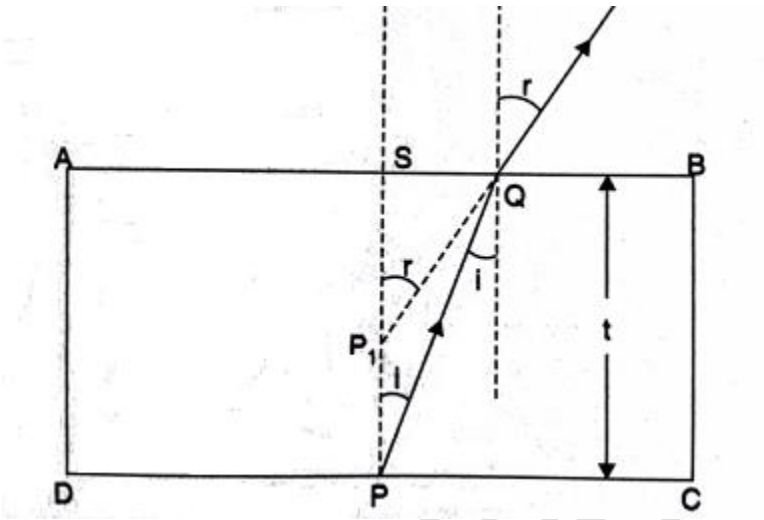
Fig:



Observation Table: L.C. = _____ cm

Serial No:	Reading on the vertical scale when microscope is focused on			Real Depth. ($R_3 - R_1$) (cm)	Apparent Depth ($R_3 - R_2$) (cm)	Refractive Index $(\frac{R_3 - R_1}{R_3 - R_2})$
	Cross mark without slab R_1 (cm)	Cross mark with slab R_2 (cm)	Lycopodium powder R_3 (cm)			

Mean Refractive index = _____

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