(*ii*) Table for determination of diameter (D) of r

S. No.	*Ring number*	*Reading of Microscope for*					
		Left end of the ring			*Right end of the ring*		
		MSR	*VSR*	*Total a (cm)*	*MSR*	*VSR*	*Total b (cm)*
	$n + 19$						

S. No.	Ring number	Reading of Microscope for Left end of the ring MSR	VSR	Total a (cm)	Right end of the ring MSR	VSR	Total b (cm)	Diameter $D = a \sim b$ (cm)	D^2 $(cm)^2$	$D^2_{n+p} - D^2_n$ (for $p = 10$)	$R = \frac{D^2_{n+p} - D^2_n}{4 \times 10\lambda}$	Mean R in (cm)
	$n + 19$								…			
	$n + 18$								…			
	↓								↓ D^2_{n+p}			
	$n + 11$								…			
	$n + 10$								…			
	$n + 9$								…			
	$n + 8$								…			
	↓								↓ D^2_n			
	$n + 1$								…			
	n								…			

S. No.	*Ring number*	*Reading of Microscope for*						*Diameter D = a ~ b (cm)*	D^2 $(cm)^2$	$D^2_{n+p} - D^2_n$ *(for p = 10)*	$R = \frac{D^2_{n+p} - D^2_n}{4 \times 10\lambda}$	*Mean R in (cm)*
		Left end of the ring			*Right end of the ring*							
		MSR	*VSR*	*Total a (cm)*	*MSR*	*VSR*	*Total b (cm)*					
	$n + 19$								...			
	$n + 18$								...			
	$\downarrow$								$\downarrow$ D^2_{n+p}			
	$n + 11$								...			
	$n + 10$								...			
	$n + 9$								...			
	$n + 8$								...			
	$\downarrow$								$\downarrow$ D^2_n			
	$n + 1$								...			
	n								...			

Calculations. Using formula

EXPERIMENT L-28: **To determine the radius of curvature of the lower s plano-convex lens by using Newton's rings apparatus.**

Apparatus. Same set up as used in Expt. L27.

Formula. Radius of curvature, $R = \dfrac{\text{slope } (m)}{4\lambda}$

where, l = wavelength of light (Sodium lamp, l = 5893 Å)

m = Slope of line drawn between $D_n^{\,2}$ and n

$$= \frac{D_{n+p}^2 - D_n^2}{p}$$

Here, D_{n+p} is the diameter of $(n+p)^{\text{th}}$ ring and D_n that of n^{th} ring.

Observations.

(i) Least count vernier of miroscope = ... cm

(ii) Table for determination of diameter (D) of rings:

S. No.	*Ring number*	*Reading of Microscope for*						*Diameter* $D = a \sim b$ *(cm)*	D^2 *(cm)*^{2}	$D_{n+p}^2 - D_n^2$ *(for p = 10)*	$D_{n+p}^2 - D_n^2$
		Left end of the ring			*Right end of the ring*						
		MSR	*VSR*	*Total a (cm)*	*MSR*	*VSR*	*Total b (cm)*				
	$n + 19$								...		
	$n + 18$								...		
	↓								↓ D_{n+p}^2		
	$n + 11$								...		
	$n + 10$								...		
	$n + 9$								...		
	$n + 8$								...		
	↓								↓ D_n^2		
	$n + 1$								...		
	n								...		

Calculations. Using formula

$$R = \frac{D_{n+p}^2 - D_n^2}{4 \times 10\lambda}$$

radius of curvature R of plano-convex lens can be calculation.

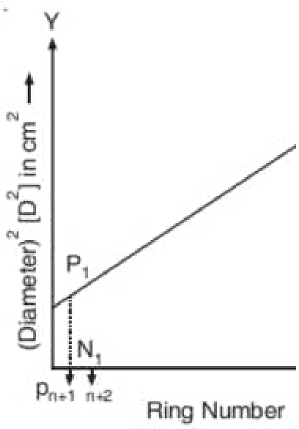

Fig. 17.7

Graph. The value of R can be determined by plotting a graph taking D^2 along Y-axis and ring number (n) along X-axis as shown in Fig. 17.7.

Two points P_1 and P_2 are taken on this graph as far apart as possible. The ordinate of P_2 is $P_2N_2 = D^2_{(n+p)}$ (say) while the ordinate of P_1 is $P_1N_1 = D^2_{\,n}$ (say).