SUBJECT – APPLIED PHYSICS (LAB)

EXPERIMENT N0. – -------

OBJECT:-To determine the radius of curvature of a Plano convex lens by Newton's ring.

APPARATUS REQUIRED:- Optical arrangement for Newton's Rings, travelling microscope, sodium lamp, short focus convex lens,reading lens.

FORMULA:-

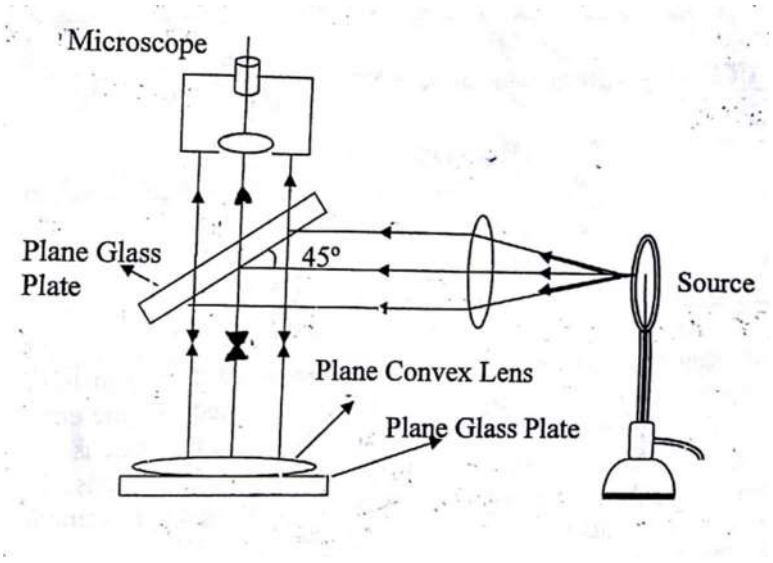
$$R = \frac{D_{n+p}^2 - D_n^2}{4p\lambda}$$

Here, R is the radius of curvature of the convex lens,

D_n is the diameter of the nth ring.

D_{n+p} is the diameter of $(n+p)^{th}$ ring,

P is a simple integer like 3, 4 or 5 and $\lambda = 5893 \times 10^{-8}$cm



PROCEDURE:-

1. Place the Newton's ring apparatus in front of sodium lamp as Shown inFigure.

2.Adjust the position of the microscope so that the point of Intersection of its x wires coincides with the center of the ring system.Then slide the microscope to the left till the vertical cross wire becomes tangential to the 12^{th} dark ring at least. Note the reading on the horizontal verneir scale of telescope.

3.Slide the microscope towards right with the help of motion screw, note the reading of when the cross wires lies tangentially on the 11^{th}, 10^{th},9^{th}.....and 1^{st} ring.

4.Now move the microscope to the right center of the ring pattern, cross wire lies to the 1^{st}, 2^{nd}, ... 12^{th} ring.

Table for $D_{(n+p)}$ and D_n

Vernier Least Count = ...

	L.H.S			R.H.S					
No. of rings	M.S.	V.S.	Total I	M.S.	V.S.	Total II	Diameter D = (I-II)	$D^2_{n+p} - D^2_n$	P=2
3	.....	.....	.....	.....	.....	.....	.....	.....	.....
5	.....	.....	.....	.....	.....	.....	.....	.....	.....
7	.....	.....	.....	.....	.....	.....	.....	.....	.....
9	.....	.....	.....	.....	.....	.....	.....	.....	.....
11	.....	.....	.....	.....	.....	.....	.....	.....	.....

CALCULATION:-

Given value of λ = 5893 x 10^{-8}cm

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

The radius of curvature of the plano convex lens is found to be R =……. cm.

PRECAUTION:-

1. The light from sodium lamp should be rendered approximately parallel by means of a short focus lens. Its height should be so adjusted that the emergent pencil from it falls on the plate of glass almost horizontally. Since the plate is inclined by 45° to the vertical into the air film is then practically zero. This setting is essential in view of the fact that theory demands it.

2. The plano convex lens used for the production of Newton's rings should have surfaces having large radius of curvature. This is necessary for two reasons: (i) the angle 0 enclosing the air film becomes very small and (ii)the rings observed have then a large diameter and hence the error in the measurement of their diameters is minimized.