EXPERIMENT-3

OBJECT: To Trace the path of ray of light incident normally on refracting face of an aquilateral prism and hence, calculate angle of deviation.

APPARATUS: An equilateral glass prism. A white sheet of paper. Four sharp Common pins Geometrical instruments. wooden drawing board, cellotape.

METHOD:

1. Spread a white sheet of paper on the wooden drawing board and secure it with pins.

2. In the middle of white sheet place an equilateral prism and mark its po boundary ABC. Remove the prism

3. On the side AB, mark a point E. At the point E draw a normal EO on the face AB.

4. Replace the glass prism on the line

Teacher's Signature...........

DE fix Two common pins P_1 and P_2 in an upright position, such that the distance between the pins is 5cm or more.

5. Look for the images of pins P_1 and P_2 from the face BC fix two more common pins P_3 and P_4 such that those pins and the images of pins P_1 and P_2 are in the same straight line.

6. Remove the pins and draw small circles around the pins points. Join P_3 and P_4 by the line MG and produced it forward to meet the side AC at F.

7. Produce the line DE forward To EK, such that it meets AC at F.

8. Measure the $\angle MFK$, it is the angle of deviation.

RESULT :

The angle of deviation (δ) = Angle MFK = $\underline{60°}$.

Theoretical Reasoning (Reasons for the path taken by the ray DE).

The magnitude of angle of deviation is 60°. The ray DE strikes the face AB at right angles and hence, does undergo any refraction. This ray strikes the surface

Expt. No.

AC of the glass prism at an angle of 60°. As the angle of incidence in the glass on the surface AC is 60°, which more than the critical angle of the prism at an angle of 60°. As the angle of incidence in the glass (42°), therefore the ray suffers internal reflection. The totally reflected ray turns through an angle of 60° and strikes the surface AC and right angle. As the totally reflected ray FG strikes the surface BC at right angles, it does not suffer any refraction and emerges along GH. The angle of deviation is the angle between the incident ray and the emergent ray.

Teacher's Signature......................................