

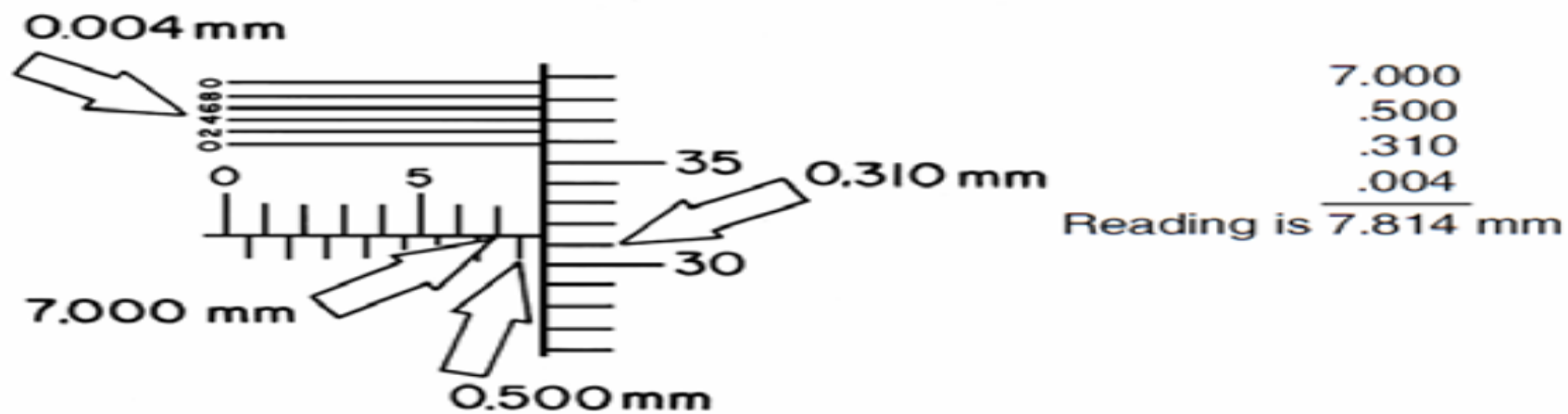
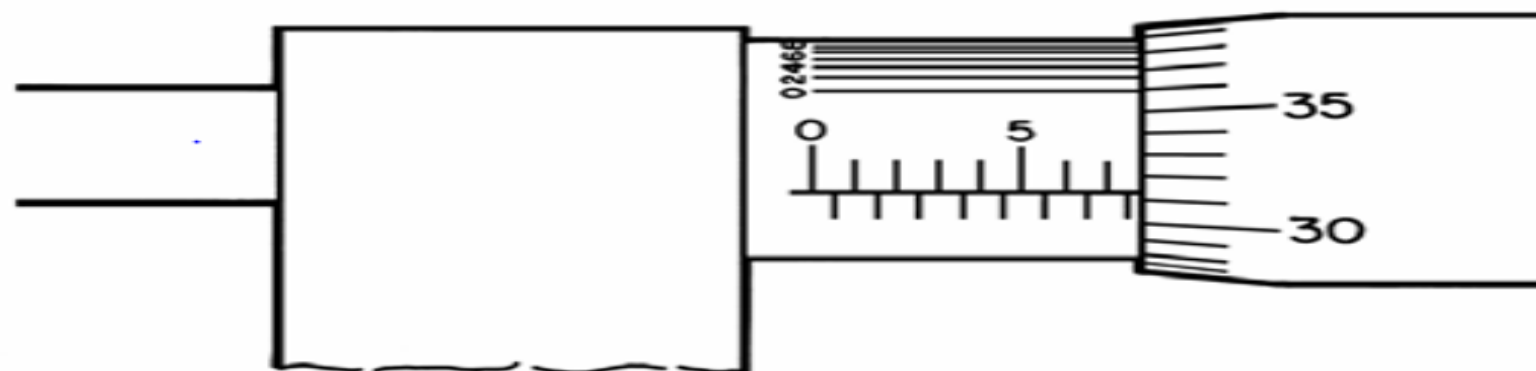
Lab#4

- **Title:** Depth micrometer and Vernier Micrometer
- **Objectives:** After studying this experiment you should be able to: i. how to assemble and use depth micrometer, ii. how to calculate least count of vernier micrometer.
- **Apparatus:** (1) Vernier Micrometer (L.C. 0.001 mm, Range 0 to 25mm)
(2) Micrometer Depth Gauge (L.C. 0.01 mm, Range 0 to 150mm) (3)
Specimen
-

Vernier Micrometer:

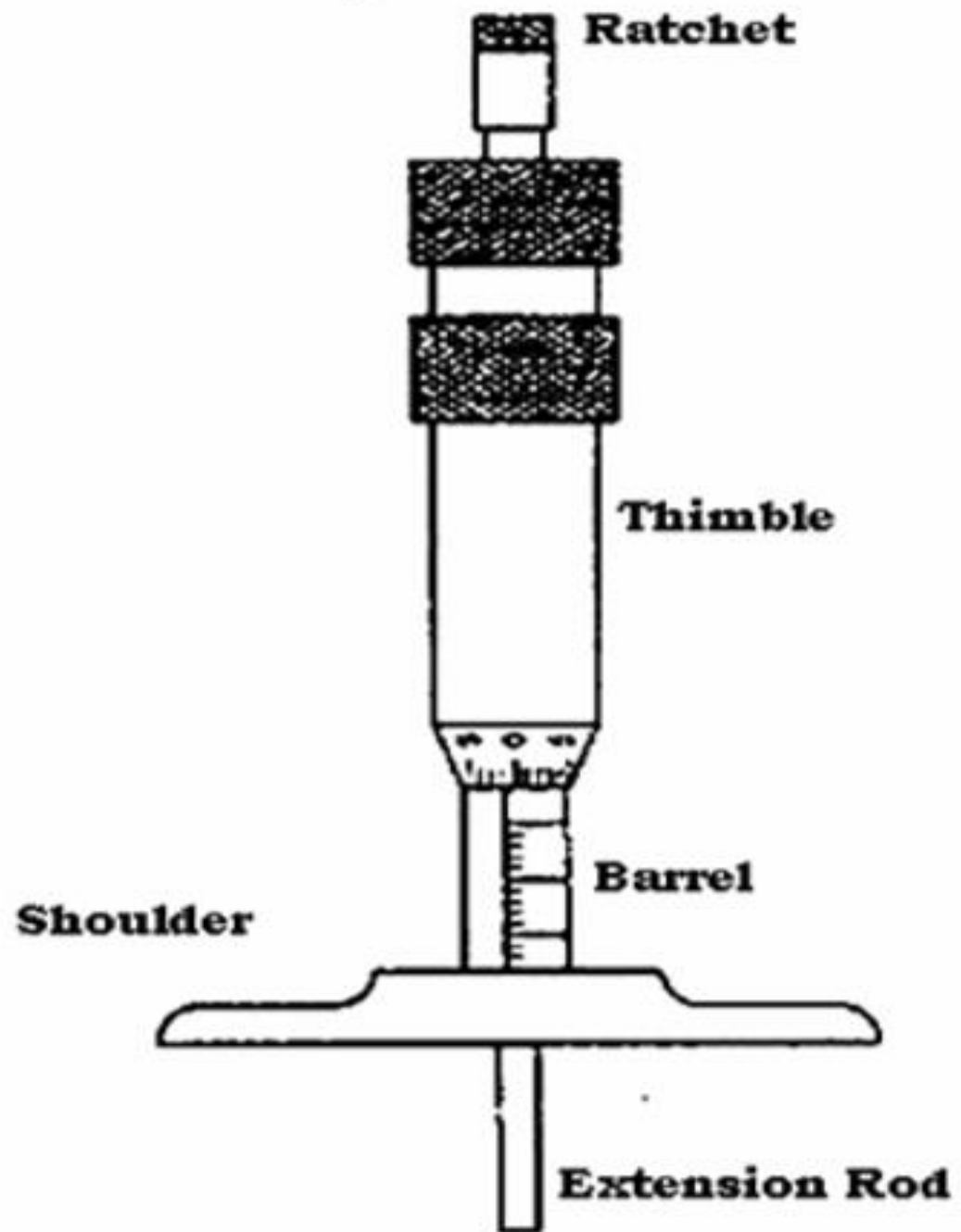
- When a vernier principle is applied to an outside micrometer, it works as vernier micrometer; hence accuracy of outside micrometer is increased. It gives reading with an accuracy of 0.001 mm. The vernier scale is engraved on the micrometer barrel. There are 10 divisions on the vernier scale, and these are equal to 9 divisions on the thimble. Hence one division on the vernier.
- Scale is equal to $1/10 \times 9 = 9/10$ that of the thimble. But one division on thimble is equal to 0.01 mm (similar to conventional micrometer). Therefore one division on vernier scale = $9/10 \times 0.01 = 0.009$ mm. The least count according to vernier principle by vernier will be, value of smallest division on thimble – value of smallest division on vernier scale = $0.01 - 0.009$ mm = 0.001 mm.
-
-

Metric-Based Vernier Micrometer



Depth micrometer:

- It is also called as micrometer depth gauge. Depth micrometer as the name indicates is used for measuring the depth of holes, slots and recesses. It has a shoulder, which acts as a reference surface.
- The shoulder is held firmly and perpendicular to the centre line of the hole. Extension rods are in steps of 25mm, used for longer range of measurement. The extension rods can easily be inserted by removing the spindle cap. When the cap is replaced, the rod is held firmly against the reference surface.
- The extension rods are marked with their respective capacity and are square with the base in any position. The measuring faces of the base and rods are hardened.



Observation Table: Depth Micrometer:

Make:

Least count:

SN	Main scale reading A	No. of circular scale division B	Circular scale readings division X Least count C	Extension rod selected	Total reading A + B + C