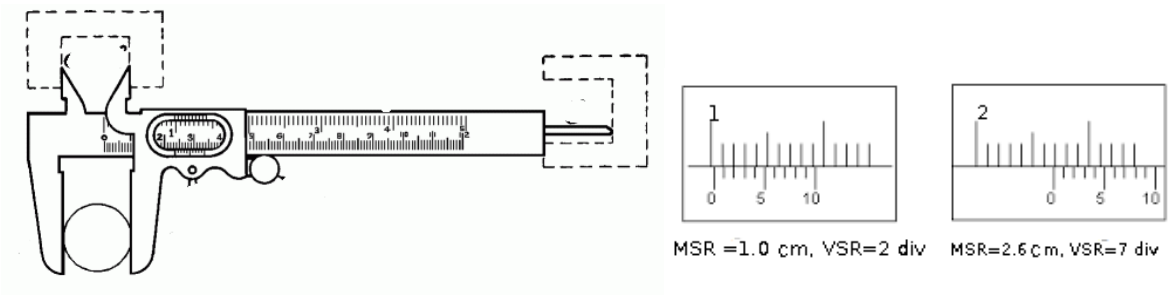
Experiment No: Date:

Vernier Calipers

Aim: 1. To find the volume of a Cylindrical Block
2. To find the volume of a Sphere
3. To find the density of the material of cylinder

Apparatus: Sphere, Cylindrical block, Calorimeter etc



Theory:

Volume of the Cylindrical Block = $\pi r^2 L$, Where L is the length of the Cylinder and Radius $r = \frac{D}{2}$ (D is the diameter of the Cylinder)

Density of the Cylinder $\rho = \frac{Mass}{Volume}$

Volume of the Sphere $V = \frac{4}{3}\pi r^3$ and $r = \frac{d}{2}$

Where r is the radius and d is the diameter of the Sphere

All the dimensions are measured using the Vernier Calipers.

Total Reading = **MSR** + (**VSR** x **LC**)

Where **MSR** is the Main Scale Reading, **VSR** is the Vernier Scale Reading and **LC** is the Least Count of the Vernier Calipers.

$$LC = \frac{1}{n} x \, Value\ of\ a\ Main\ Scale\ Division$$

Where **n** is the total number of divisions of the vernier scale

Observations:

Zero Error = Nil

Value of a main Scale division (1msd) = mm = cm

Total number of divisions of the Vernier n = div

$LC = \frac{1}{n} x \, 1\,msd$ = cm

1. Volume of the Cylinder

Dimension	**Sl. No**	**MSR cm**	**VSR div**	**MSR + (VSR x LC) cm**	**Mean cm**
Length of the Cylindrical Block	1 2 3 4 5 6				L =
Diameter of the Cylindrical Block	1 2 3 4 5 6				D =

Calculations:

Volume of the Cylindrical Block = $\pi r^2 L$ = **cm³**

= **m³**

Mass of the Cylindrical block (given) = kg

Density of the Cylinder $\rho = \frac{Mass}{Volume}$ = kg/m³

= kg/m³

2. Volume of the Sphere

Dimension	**Sl. No**	**MSR cm**	**VSR div**	**MSR + (VSR x LC) cm**	**Mean cm**
Diameter of the Sphere	1 2 3 4 5 6				d =

Radius of the sphere $r = \frac{d}{2}$ = cm = m

Volume of the Sphere $V = \frac{4}{3}\pi r^3$ = m³

Results:

1. Volume of the given Cylindrical block = m³
2. Density of the material of the Cylinder = kg/m³
3. Volume of the given Sphere = m³