



STEPPING STONE SCHOOL (HIGH)

CLASS - IX

PHYSICS

WORKSHEET- 3

Date – 1/05/2020

Chapter- MEASUREMENT (III)

Topic- Vernier Callipers

Time limit: 30 minutes.

Please read the notes carefully and on the basis of it copy down the questions and solve them on a sheet of paper date wise. Keep the worksheet ready in a file to be submitted on the opening day.

Use of Vernier Callipers:

It is used to measure the length of a rod, the diameter of a sphere, the internal and external diameters of a hollow cylinder etc.

Zero error:

When the jaws are in contact and the zero mark of the Vernier scale coincide with zero mark of the main scale the Calliper is free from zero error.

2 types of zero error area:

(1) Positive zero error – if zero mark of the Vernier scale is on the right of zero mark of the main scale.

(2) Negative zero error: if zero mark of the Vernier scale is on the left of zero mark of the main scale.

Correct reading = observed reading

- zero error

Example:

The least count of Vernier Calliper is 0.01 cm and its zero error is = 0.02 cm. While measuring the length of rod, the main scale reading is 4.8cm and the 6th division on Vernier is in line with the marking on the main scale. Calculate the length of the rod.

Solution:

L C = 0.01 cm

Zero error = = 0.02 cm

MSR = 4.8 cm

VSR=6

Observed reading = 4.8 + 6.01

= 4.8 + 0.06

= 4.86 cm

Length of the rod = 4.86 – (+0.02)

= 4.86 – 0.02

= 4.84 cm

Exercise:

- (1) A boy uses a Vernier Calliper to measure the thickness of pencil. He measures it to be 1.4 mm. If zero error of Vernier is + 0.02 cm, what is the correct thickness?
- (2) A Vernier Calliper has its main scale graduated in mm and 10 divisions on its Vernier scale are equal in length to 9mm. When the two jaws are in contact the zero of Vernier scale is ahead of zero of main scale and 3rd divisions of Vernier scale coincide with a main scale division. Find (i) the least count (ii) zero error of Vernier Calliper
- (3) When is a Vernier Calliper said to be free from zero error?
- (4) Name the main parts of Vernier and state their functions.
- (5) Define the term Vernier constant and state the principle of Vernier.
- (6) The main scale of Vernier calliper is calibrated in mm and 19 divisions of main scale are equal in length to 20 divisions of Vernier scale. In measuring the diameter of a cylinder, the main scale reads 35 divisions and 4th division of Vernier scale coincides with a main scale division. Find (i) least count (ii) radius of cylinder.