Daily Practice Problems

Q1) The diameter of a cylinder is measured using a Vernier calipers with no zero error. It is found that the zero of the Vernier scale lies between 5.10 cm and 5.15 cm of the main scale. The Vernier scale has 50 divisions equivalent to 2.45 cm. the 24th division of the Vernier scale exactly coincides with one of the main scale divisions. The diameter of the cylinder is

    a. 5.112 cm
   b. 5.124 cm
    c. 5.136 cm
    d. 5.148 cm

Ans) b

Q2) A Vernier calipers has 1 mm marks on the main scale. It has 20 equal divisions on the Vernier scale which match with 16 main scale divisions. For this Vernier calipers, the least count is

    a. 0.02 mm
    b. 0.05 mm
    c. 0.1 mm
    d. 0.2 mm

Ans) d

Q3) There are two Vernier calipers both of which have 1 cm divided into 10 equal divisions on the main scale. The Vernier scale of one of the calipers (C_1)nhas 10 equal divisions that correspond to 9 main scale divisions. The Vernier scale of the other caliper (C_2) has 10 equal divisions that correspond to 11 main scale divisions. The readings of the two caliupers are shown in the figure.
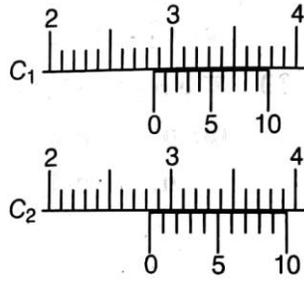
The measured values (in cm) by calipers C_1 and C_2 respectively, are

a. 2.87 and 2.87
b. 2.87 and 2.83
c. 2.85 and 2.82
d. 2.87 and 2.86

Ans) b

Q4) N divisions on the main scale of a Vernier calipers coincide with (N+1) divisions on the Vernier scale. If each division on the main scale is of a unit, determine the least count of the instruments

Ans) As given in your notes.

Q5) The edge of a cube is measured using a Vernier calipers. (9 divisions of the main scale is equal to 10 divisions of Vernier scale and 1 main scale division is 1mm). the main scale division reading is 10 and 1 division of Vernier scale was found to be coinciding with the main scale. The mass of cube is 2.736 g. calculate the density in g/cm^3 up to correct significant figures.

Ans) $2.66 g/m^3$

Q6) A student measured the length of a rod and wrote it in as 3.50 cm. which instrument did he use to measure it?

a. A meter scale
b. A Vernier caliper where the 10 divisions in Vernier scale matches with 9 divisions in main scale and main scale has 10 divisions in 1 cm
c. A screw gauge having 100 divisions in the circular scale and pitch as 1 mm
d. A screw gauge having 50 divisions in the circular scale.

Ans) b

Q7) 1 cm on the main scale of a Vernier calipers is divided into 10 equal parts. If

10 divisions of Vernier coincide with 8 small divisions of main scale, then the least count of the

calipers is

1. 0:01 cm
2. 0:05 cm
3. 0:005 cm
4. 0:02 cm

Ans) d

Q8) The Vernier constant of a travelling microscope is 0:001 cm. If 49 main scale

divisions coincide with 50 Vernier scale divisions, then the value of 1 main scale division is

1. 0:1 mm
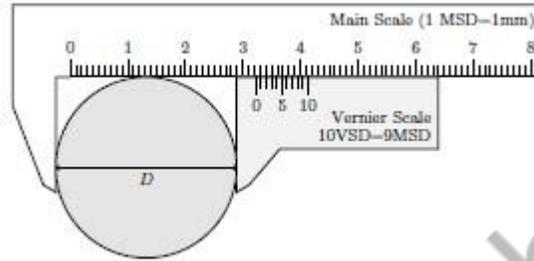2. 0:4 mm
3. 0:5 mm
4. 1 mm

Ans) c

Q9) Diameter of a steel ball is measured using a Vernier calipers which has divisions

of 0.1 cm on its main scale (MS) and 10 divisions of its Vernier scale (VS) match 9 divisions

on the main scale. Three such measurements for a ball are (1) MSR = 0:5 cm, VSD = 8 (2)

MSR = 0:5 cm, VSD = 4 (3) MSR = 0:5 cm, VSD = 6. If the zero error is 0:03 cm, then mean

corrected diameter is

a. 0.53 cm
b. 0.56 cm
c. 0.59 cm

d.   0.52 cm

Ans) c

Q10) The zero error of the Vernier calipers shown in Figure 10 is 0.9 mm. What is the diameter of the sphere being measured in the Figure

Ans) 3.14 cm.