LAB Report NO 2

Title :- Screw Gauge

Experiment :- Use the screw gauge to measure the diameter of a small bob and a large bob.

Objective :- Screw Gauge can be used to measure :

- Thickness of a glass.
- Diameter of metal sphere.
- Diameter of wire.
- Thickness of thin sheet.

Apparatus :-

- Screw Gauge.
- Small bob. m_1
- Large bob. m_2
- Calculator.

Procedure :-

1. First check the screw gauge for zero error by closing the circular.

2. If the 0 of circular scale is below the base line then it is **positive zero error** and if 0 of circular scale is above the base line then it is **negative zero error.**
3. Note down the zero error.
4. Now place the small bob in-between the spindal and annual.
5. Rotate the thimble to tighten the bob. Use the rachet to tighten it even more.
6. Record the reading on **M.S** and **C.S.**
7. Then find the diameter x by using formula,

$$x = M.S.R + (C.S.R \times L.C)$$

8. Add the zero error in the final reading if it is **negative zero error** and subtract the zero error if it is **positive zero error.**
9. Repeat step # 4, 5, 6, 7, 8 for large bob m_2.
10. Calculate average reading of small bob as well as the big bob.

Result :-

1) The diameter of small bob is 11.64 mm
2) The diameter of large bob is 17.89 mm.

ZERO ERROR :-

$$Z.E = n \times L.C$$
$$Z.E = 4 \times 0.01\,mm$$
$$Z.E = -0.04\,mm$$

∴ Zero error is negative.

Small Bob.

Sr No.	M.S.R	C.S.R	Diameter	Positive zero error correction.
01	11.5mm	10	11.5 + (10 × 0.01) = 11.6	11.6 + 0.04 = 11.64mm
01	11.5mm	10	11.5 + (10 × 0.01) = 11.6	11.6 + 0.04 = 11.64mm

Average :-

$$X = \frac{R_1 + R_2}{2}$$

$$X = \frac{11.64 + 11.64}{2}$$

$$X = 11.64\,mm$$ ANS

ZERO ERROR :-

$$Z.E = n \times L.C$$

$$Z.E = 4 \times 0.01mm$$

$$Z.E = 0.04\ mm$$

Large Bob.

Sr No.	M.S.R	C.S.R	Diameter	Positive zero error correction.
01	17.5mm	35	$17.5+(35\times 0.01)=17.85$	$17.85+0.04=17.86$ mm
02	17.5mm	35	$17.5+(35\times 0.01)=17.85$	$17.85+0.04 = 17.86$ mm

Average :-

$$X = \frac{R_1 + R_2}{2}$$

$$X = \frac{17.86 + 17.86}{2}$$

$$\boxed{X = 17.86\ mm}$$ Ans