Working formula:

- To find velocity of sound at lab temperature ($\boldsymbol{v_t}$):

  Using the standard value of velocity of sound at NTP, $v_o = 332\ m/s$,

  The velocity of sound at lab temperature (t^oC) is:

$$\boldsymbol{v_t = \sqrt{\frac{T_t}{T_o}} \times v_o}$$

- To find the frequency of tuning fork (f):

$$\boldsymbol{f = \frac{v_t}{2(l_2 - l_1)}}$$

- To find end correction of tube (e):

$$\boldsymbol{e = \frac{l_2 - 3l_1}{2}}$$

PROCEDURE:

1. Pour water into the water reservoir so that it fills the resonance pipe completely (be sure that the resonance apparatus is perfectly vertical).
2. Take a tuning fork and strike the fork against a rubber pad. Hold the vibrating tuning fork horizontally slightly above the resonance pipe.
3. Adjust the water level (by lowering the water reservoir) till loud sound is heard. This is the condition of first resonance. Note the resonating length of air column (first resonating length l_1).
4. Now further lower the water level and obtain the second resonance (keeping the vibrating tuning fork above the pipe). Note the resonating length of air column (second resonating length l_2).
5. Repeat the step 4 and 5 for same tuning fork.
6. Use appropriate formula to find the frequency of tuning fork.
7. Use appropriate formula to find the end correction of the pipe.

OBSERVATION:

Laboratory temperature, $t =$… … ^oC

$$\therefore \quad T_t = (t + 273)\ \text{K}$$

$$= \ldots \ldots \ldots \text{ K}$$

Velocity of sound at NTP, $\boldsymbol{v_o} =$ … … … $\boldsymbol{m/s}$

$\therefore$ velocity of sound at lab temperature, $\boldsymbol{v_t = \sqrt{\frac{T_t}{T_o}} \times v_o}$

or, $v_t =$ … … …

or, $v_t =$ … … … m/s

Least count of meter scale = … … …

Least count of Vernier calliper = … … …

Internal diameter of resonance tube, $\boldsymbol{d} =$ … … …