Calibration of Vernier Calipers and preparation of height gauges using slip gauges

AIM:

1. To calibrate the given vernier calipers with respect to a standard reference i.e. slip gauge set and to draw the calibration curve.
2. Preparation of height gauges using slip gauges set.

MEASURING INSTRUMENTS & TOOLS:

1. Vernier calipers
2. Slip gauge set

THEORY:

Measuring instruments in usage will acquire certain errors due to wear and tear. So, every instrument should be checked periodically to find out the errors and assess the accuracy. Comparing the reading of the instrument with a standard reference does this. This type of inspection is known as calibration. Depending on the type of instrument the standard reference is selected, against which the error of the instrument is evaluated. Since the error cannot be eliminated from the instrument, corresponding correction is applied to the measured reading of the instrument. Since the wear and tear of the instrument is not uniform, the error in the measured value will be different at different ranges of the instrument. To apply correction for the various readings in the range of the instrument, a calibration curve is to be drawn. Calibration curve is the curve drawn between the error and the instrument reading. The error at any stage of the instrument can be either positive or negative. The correction to be applied for a positive error is negative and vice–versa

PROCEDURE:

1. The least count of the Vernier calipers was found.
2. The two jaws of the Vernier calipers were cleaned and vernier was checked for zero error by bringing the two jaws close at each other.
3. The given set of slip gauges, which is used as standard reference, was cleaned.
4. A slip gauge was placed in between the two jaws of Vernier calipers and was adjusted.
5. The slip gauge size and corresponding Vernier calipers reading were noted down. The difference between Vernier calipers reading and slip gauge size is the error.
6. The experiment was repeated for slip gauges of different sizes within the range of the Vernier calipers and the readings were tabulated and corresponding errors were found.
7. A graph is plotted against Vernier calipers reading and error / correction obtained.

PRECAUTIONS:

1. Slip gauges should be degreased properly.
2. Vernier reading should be taken without parallax error.

3. Slip gauges should be increased in size with regular increments within the range of the Vernier and wringing should be done properly to get the required size.
4. Over tightening of the slip gauge in between the jaws of the instrument should be avoided.

OBSERVATIONS:

Least count of Vernier calipers =

S.No	Vernier calipers reading X mm	Slip gauge reading Y mm	Error E = X - Y	Correction C mm

GRAPH: