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INTRODUCTION TO MECHANICAL WORKSHOP

A mechanical workshop is a shop floor or facility where users acquires knowledge about practical work on a particular subject.
Workshop practice provides the basic working knowledge of the production and properties of different material used in the industry. It also explains the use of different tools, equipment, machinery and techniques of manufacturing, which ultimately facilitates shaping of these materials into various usable forms.

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Safety Precautions At Mechanical Workshop

- Don't wear loose clothing
- long hair must be tied back or covered
- Always wear covered shoe
- Check the power cords and plugs of the tools or portable machines before using them
- Don't open any power operated tools while it is running proper protection of proper under should be taken for eyes
- Don't try to remove foreign particle from the eye instead report to sir - for medical treatment.
- Don't keep the sharp tools on the side of the working table
- All machines must be operated with all required safety guard in place
- Machine must be shut off when not in use or cleaning, repairing or oiling.
- Hand hammer should not be used to strike machine part
- Always store oily rags in an approved Metal container
- Personal protective equipment (PPE) such as welding helmet, gloves, apron should be used at the time of welding

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EXPERIMENT - 1

MEASURING INSTRUMENT

The instrument that is used for measurement of certain physical quantity is called as measuring instrument like length, height, width etc can be measured by measuring instrument

It is of two types :- (i) Direct measuring Instrument
(ii) Indirect measuring Instrument

Direct measuring Instrument :- These Instruments are used directly with the job piece to take measurement as well as the value. eg: steel rule, micrometer, vernier caliper etc.

Indirect measuring Instrument :- These Instruments are used directly with the job piece to take measurement and finally the value is obtained with the help of direct measuring instrument eg :- outside / inside caliper, Divider, try square etc.

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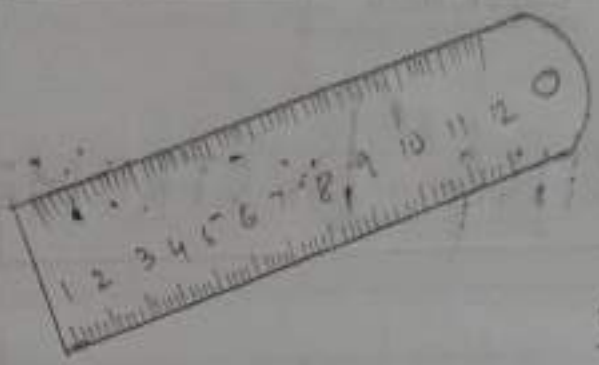
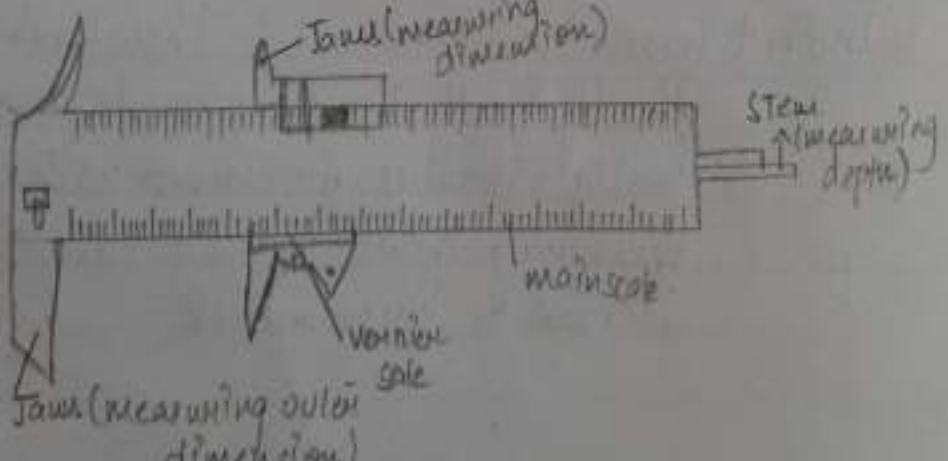


STEEL RULE

MEASURING TAPE



VERNIER CALIPER

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Direct Measuring Instrument

1.) Steel Rule

The steel rule is our easy and quickest mean to measure the linear dimensions of a component with limited accuracy. (It is direct measuring Instrument)

2.) Measuring Tape

A measuring tape is a flexible ruler and used to measure distance.
It consists of ribbon of cloth, plastic or metal strip with linear - measurement markings. It is a common measuring tool.

3.) Vernier Caliper

It is a measuring device used to precisely measure linear dimensions. It is a very useful instrument to measure the inside dimension, outside dimension and depth of any object

Least count = one main scale division - one vernier scale division.

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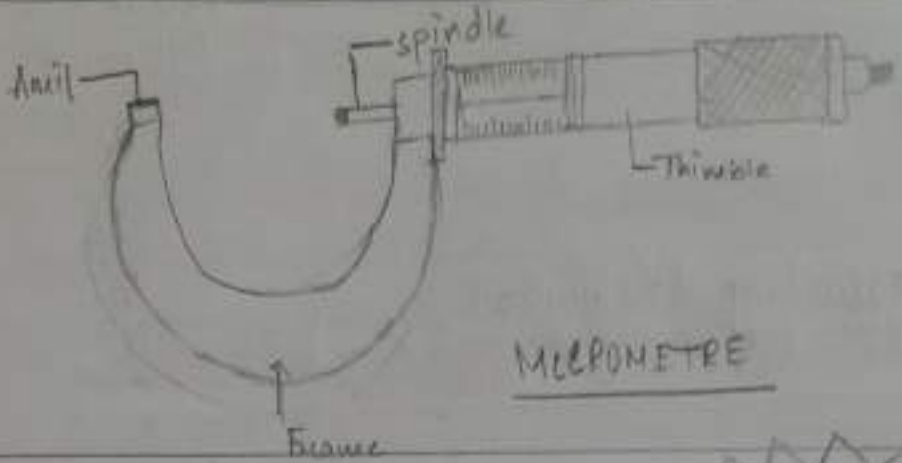
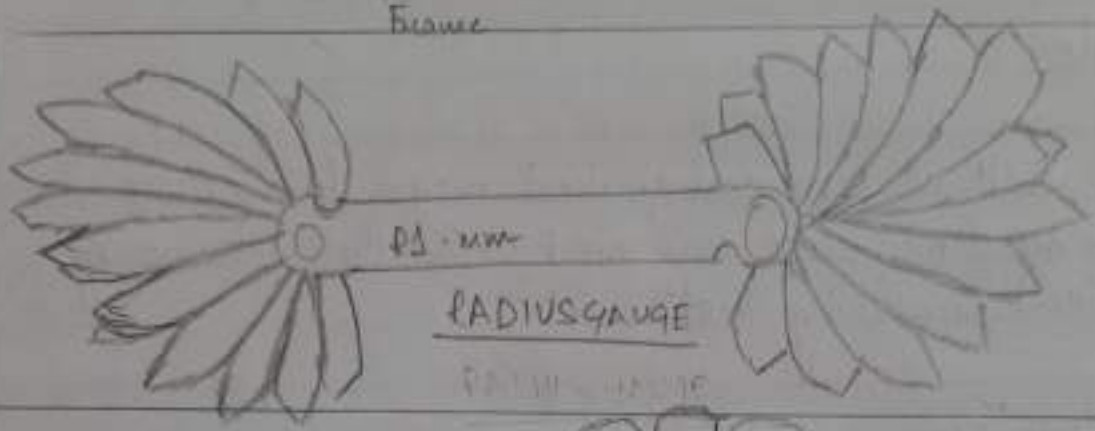
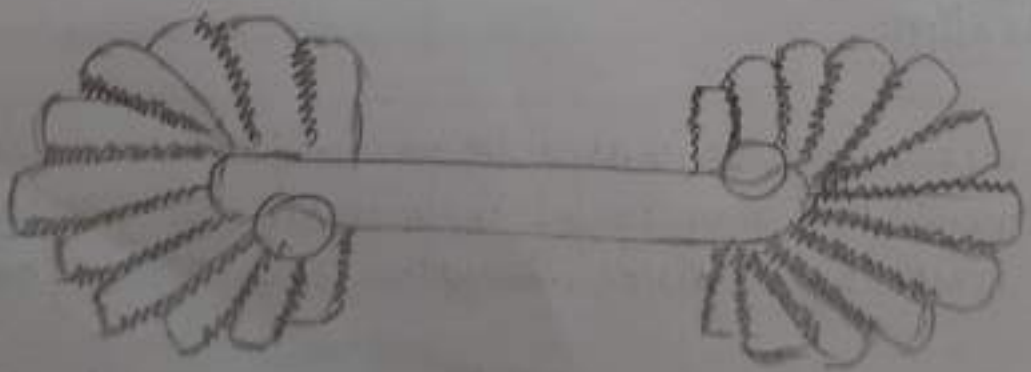


MICROMETRE



FEELER GAUGE



THREAD GAUGE

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4.) Micrometer

It is sometimes known as a screw gauge, is a device incorporating a calibrated screw widely used for accurate measurement of depths, length and thickness of an object.

5.) Radius Gauge

A radius Gauge is a tool used to measure the radius of an object. Every leaf has a different Radius

6.) Feeler Gauge

Feeler gauge consists of a number of small lengths of steel of different thickness with measurements marked on each piece
A feeler gauge is also used to measure gap widths

7.) Thread Gauge

A thread gauge is used to measure the pitch or lead of a screw thread. This is a direct measuring Instrument.

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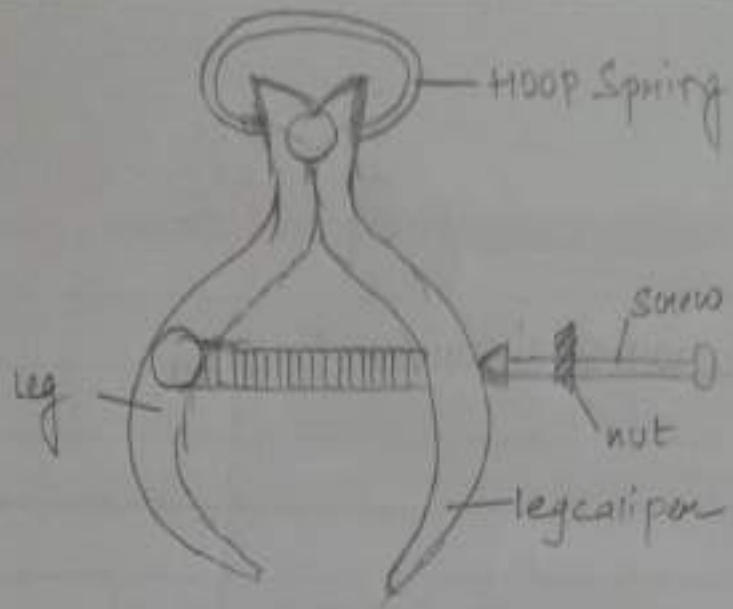
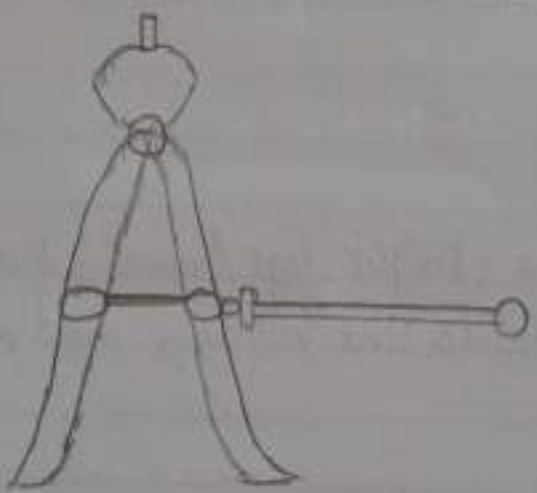
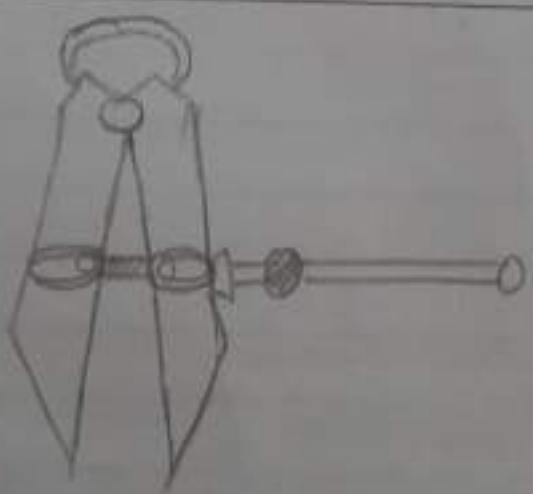


OUTSIDE CALIPER



INSIDE CALIPER



DIVIDER

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Indirect Measuring Instrument

1.) Outside Caliper

Outside caliper is a indirect measuring instrument outside calipers measures thickness and outside diameters of objects

2.) Inside Caliper

Inside calipers have straight legs turned out at the bottom, and are used to measure inside dimensions such as the inside diameter of a hole or tube

3.) Dividers

Dividers are one of the earliest and most basic types of mathematical instrument. They can be used for geometrical operations such as scribing circles but also for taking off and transferring dimensions.

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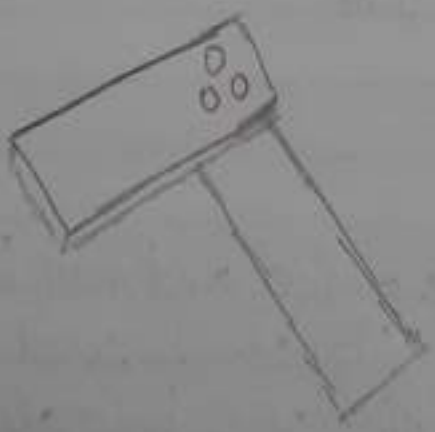
ODD LEG CALIPER



TRY SQUARE

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4) Odd leg Caliper

Odd legs caliper has one leg bent inward and one straight leg ending in a sharp point; this type of caliper is used for scribing lines at a specified distance from a flat or curved surface (parallel line) and to find the centre of a cylindrical object

5) Try Square

It is composed of two parts, the stock and the blade. It is used for measuring the accuracy of a right angle (90 degrees) and is also used to check the straightness of a surface or correspondance to an adjoining surface.