

Name: Hafiz Muhammad Rashid malik

ROLL N:BS TECH MECHANICAL MTOO1

Subject: Metal Cutting and Machinery Tools

Date: 11-jan-2021

Sir: Mr Naqi Hasnain

Q1

Machining.

Machining is any of various processes in which a piece of raw material is cut into a desired final shape and size by a controlled material-removal process. The many processes that have this common theme, controlled material removal, are today collectively known as subtractive manufacturing, in distinction from processes of controlled material addition, which are known as additive manufacturing. The precise meaning of the term "machining" has evolved over the past two centuries as technology has advanced.

Single point cutting tool.

A single-point cutting tool can be used for increasing the size of holes, or boring. Turning and boring are performed on lathes and boring mills. Multiple-point cutting tools have two or more cutting edges and include milling cutters.

multipoint cutting tools.

Cutting Tool is a wedge shaped device that actually removes (shears off) excess material from a preformed blank in order to obtain desired shape, size and accuracy. While machining or metal cutting operation, the cutter forcefully compresses a thin layer of material in the workpiece and gradually shears it off. However, to remove material, three relative motions are necessary. These motions actually provide necessary cutting velocity, feed velocity and depth of cut. Cutting tool itself cannot provide any such motion as it is rigidly mounted on tool holder in machine tool. All necessary motions are supplied by machine tool using various arrangements.

Orthogonal Cutting.

is a type of cutting in which the cutting tool is perpendicular to the direction of tool motion. In this cutting, the flow of chip is perpendicular to cutting edge. The tool has lesser cutting life in this type of cutting.

the direction of flow of chip is perpendicular to the direction of movement of cutting edge. The tool has greater cutting life as compared to orthogonal cutting. the direction of flow of chip is not perpendicular to the direction of movement of cutting edge.

Oblique Cutting.

The main difference between orthogonal and oblique cutting is that in orthogonal cutting, cutting edge of tool is perpendicular to the direction of motion but in oblique cutting the cutting edge make an angle with direction of motion.

The cutting angle of tool does not make right angle to the direction of motion.

The shear force per unit area is low which decrease heat per unit area.

Micrometer's.

As we know the micrometer has wide application in all fields of science during different scientific experiments and in engineering to measure the values of finest objects up to higher precision and accuracy so for better understanding and to ensure the appropriate use of micrometer, firstly we must have to know its mechanism and basic parts, construction and main function.

Vernier Calipers.

It has already been established that the Vernier caliper is one of the most widely used measuring instruments after the measuring scale.

The concept for the vernier caliper came into being way back in 1631 thanks to French scientist Pierre Vernier but it has been going strong since then.

The vernier caliper allows users to measure distances with a far greater degree of accuracy than a measuring scale.

Q2

vernier scales and what are their sources of errors

A vernier caliper is an instrument which is most commonly used for a variety of exact measurements, which was not necessarily related to the engineering manufacturer.

There are three types of vernier caliper used in the physics laboratory to measure lengths of small objects accurately which could not have been possible with a metre scale.

.The main use of the vernier caliper is to measure the internal and external diameters of an object. The word caliper means any instrument with two jaws which is used to determine the diameters of objects

.The principle of the vernier caliper is that when two scales or divisions slightly different in size are used, then the difference between them is used to increase the accuracy measurement.

.There are two jaws on vernier caliper upper jaw and lower jaw. These jaws together are used to hold the object firmly while measuring its length which is not possible with a metre scale.

The Principle of Vernier Caliper.

A scale cannot measure objects which are smaller than 1mm but a vernier caliper can measure objects up to 1mm. As already know that vernier caliper has two scales the main scale and the vernier scale together this arrangement is used to measure very small lengths like 0.1mm.

Vernier Caliper Zero Error.

Zero error in the vernier caliper is a mathematical error due to which, The zero of the vernier scale does not coincide with the zero of the main scale.

In other words, if the zero mark on the vernier scale doesn't coincide with the zero mark on the main scale, then the error that occurs is called zero error.

They are of 3 types of error.

no zero erro.

Positive zero error

Negative zero error.

no zero error.

In no zero error, when we bring two jaws together. You will see zero of the Main scale is coinciding with the zero of the vernier scale. they are exactly in a straight line so this vernier caliper is free from zero error or you can say there is no zero error in this vernier caliper.

positive zero error.

In positive zero error, Let's bring these jaws together. you see, the zero of vernier scale is ahead of main scale zero. Or you can say zero of vernier scale is at the right side of main scale zero.

negative zero error,

In negative zero error, we will bring the two jaws together. Here you can see zero of vernier scale is the back side of main scale zero. Or to the left of main scale zero.

