



3055 BA SANGAM COLLEGE

PH: 6674003/9264117 E-Mail: basangam@connect.com.fj

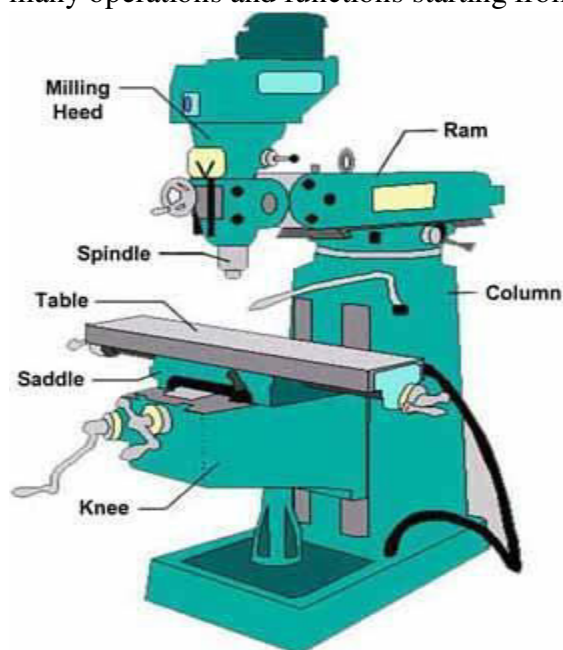


WORKSHEET NO: 8

Subject: Applied Technology/ Year 13	Year/Level: 13
Topic : Motorized machines	Date: 19/07/21
Topic: APPLIED ENGINEERING	

Vertical Milling Machines

Milling is a process performed with a machine in which the cutters rotate to remove the material from the work piece present in the direction of the angle with the tool axis. With the help of the milling machines one can perform many operations and functions starting from small objects to large ones.



Milling machining is one of the very common manufacturing processes used in machinery shops and industries to manufacture high precision products and parts in different shapes and sizes.

Milling Machine

The milling machines are also known as the multi-tasking machines (MTMs) which are multi-purpose machines capable of milling and turning the materials as well. The milling machine has got the cutter installed up on it which helps in removing the material from the surface of the work piece. When the material gets cooled down then it is removed from the milling machine.

Milling Process

The milling machine involves the following processes or phases of cutting:

Milling Cutters

There are a lot of cutting tools used in the milling process. The milling cutters named end mills have special cutting surfaces on their end surfaces so that they can be placed onto the work piece by drilling. These also have extended

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cutting surfaces on each side for the purpose of peripheral milling. The milling cutters have small cutters at the end corners. The cutters are made from highly resistant materials that are durable and produce less friction.

Surface Finish

Any material put through the cutting area of the milling machine gets regular intervals. The side cutters have got regular ridges on them. The distance between the ridges depends on the feed rate, the diameter of the cutter and the quantity of cutting surfaces. These can be the significant variations in the height of the surfaces.

Gang Milling

This means that more than two milling cutters are involved in a setup like the horizontal milling. All the cutters perform a uniform operation or it may also be possible that the cutter may perform distinct operations. This is an important operation for producing duplicate parts.

Types of Milling Machines

The two main configurations of the milling machining operations are the types of milling machines. These are the vertical mill and the horizontal mill. They are further discussed below:

Vertical Milling Machines

The vertical mill has a vertically arranged spindle axis and rotate by staying at the same axis. The spindle can also be extended and performing functions such as drilling and cutting. Vertical mill has got two further categories as well: turret mill and bed mill.

ACTIVITY

The Drill Press is one of the safest workshop machines used for drilling holes and other operations using special attachments.

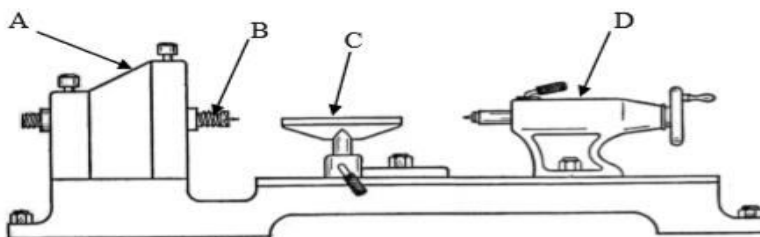
- (i) Name two other operations other than drilling that can be carried out on the Drill Press.

- (ii) Use a sketch to show the method of holding a cylindrical metal piece while drilling holes using a Drill Press.

State a limitation of a Drill Press.

- (b) Study the diagram of a Wood working lathe given below and answer the questions that follow.

- (i) Name the parts labeled A and D.



(ii) Explain the functions of the parts labeled B and C.

(c) A Band Saw is a versatile machine used to cut curves and straight lines in thin and thick material such as woods, plastics and metals.

(i) State one adjustment that needs to be made before starting the machine.

(ii) Give a reason for the breakage of Band Saw blades.
