

MILLING

Q1. How a Milling machine is specified?

→ It is specified by:

- i) Size of work surface (longitudinal by breadth)
- ii) Power traverse (longitudinal by cross by vertical)
- iii) Number of spindle speed
- iv) Number of feed, spindle, nose, taper
- v) Available power (power rating)

Q2. What is the difference between UP milling and DOWN Milling?

→ UP Milling	DOWN Milling
<p>→ It is process of removal of metal by a cutter which is rotated against the direction of travel of work piece.</p> <p>ii) Thickness of chip is minimum at beginning and maximum when cutting terminates.</p> <p>iii) Also called conventional milling.</p> <p>iv) Due to typical nature of cut, pouring coolant on cutting edge is difficult.</p>	<p>i) It is process of removal of metal by a cutter is rotated in same direction of travel of work piece.</p> <p>ii) Thickness of chip is maximum at beginning and maximum ^{minimum} when cutting terminates.</p> <p>iii) Also called climb milling.</p> <p>iv) Pouring coolant is relatively easier.</p>

Q3. What operation may be done in a milling machine?

→ The operation that may be performed are:

- i) Plain milling: produces a plain, horizontal surface parallel to axis of rotation.
- ii) Face milling: It is performed by a face milling cutter.

- (vi) Side milling : It produces flat vertical surface on the side of work piece.
- (v) Straddle milling : It produces vertical surface on both side of work piece.
- v) Angular milling : produces an angular surface on work piece.
- vi) Gang milling
- vii) Profile milling
- viii) Helical milling
- ix) Form milling
- x) End milling
- xi) Cam milling

SHAPING MACHINE

Q1. Draw and explain a quick return mechanism in a shaping machine.

→ The shaper mechanism is so designed that it allows the ram holding the tool to move at a comparatively slower speed during the forward cutting stroke, the cutting speed depending on the type of material and machining condition, whereas return stroke allows the ram to move at a faster rate to reduce idle return time. This slow forward but quick return, reciprocating motion is called quick return mechanism.

Q2. Explain the function of clapper box.

→ The clapper box houses the clapper ~~box~~ block. The tool post is mounted on the clapper ~~box~~ block. In forward cutting stroke the clapper block fits securely to the clapper box to make a rigid tool support. In return stroke, the clapper box lifts up clapper block to prevent tool cutting edge from dragging and wear. The work surface is also ~~proper~~ prevented from damage.

Q3. How the stroke length and position of stroke in shaping machine is adjusted?

→ The crank pin is fastened to sliding block which can be adjusted. The block is again mounted upon the radial slide bolted to centre of bull gear. The bull gear, at the centre of bull gear is mounted rotated. This causes the sliding block to be brought inward and outward. The closer the pin is brought to centre of bull wheel, smaller is stroke. Thus, the stroke length is adjusted.

By rotating the handwheel, the screwed shaft fitted in ram may be made to rotate through two bull gears. The ram block act as a nut. When machine is in operation, the clamping lever is tightened upon ram body. In order to set the position of tool, clamping lever is loosened and by rotating the handwheel the screwed shaft rotates. It causes ram to move forward or backward accordingly. Thus, the position of stroke is adjusted.

Q.4. Explain the feed mechanism of shaping machine.

→ In a shaper both downfeed and crossfeed may be obtained. Unlike, lathe these feed movements provided intermittently and during end of return stroke only. Vertical or level surface are obtained by rotating the downfeed screw by hand. Cross feed movement is used to machine a flat horizontal surface. Rotation of crossfeed screw causes table mounted upon the saddle to move sideways through a predetermined amount at the end of each return stroke so as to bring the uncut surface in direct path of reciprocating tool.