

## CLASSIFICATION OF PUMPS

On the basis of transfer of mechanical energy, the pumps can be broadly classified as follows:

### 1. Rotodynamic pumps:

- (i) Radial flow pumps
- (ii) Axial flow pumps
- (iii) Mixed flow pumps.

### 2. Positive displacement pumps.

In rotodynamic pumps, increase in energy level is due to a combination of centrifugal energy, pressure energy, and kinetic energy.

- The energy transfer, in a radial flow pump, occurs mainly when the flow is in its radial path.
- In an axial flow pump, the energy transfer occurs when the flow is in its axial direction.
- The energy transfer in a mixed flow pump takes place when the flow comprises radial as well as axial components.
- The radial flow type pumps are commonly called centrifugal pumps

### **Classification of centrifugal pumps:**

On the basis of characteristic features, the centrifugal pumps are classified as follows:

#### 1. Type of casing:

- (i) Volute pumps (ii) Turbine pump or diffusion pump.

#### 2. Working head:

- (i) Low lift centrifugal pumps, they work against heads upto 15 m
- (ii) Medium lift centrifugal pumps used to build up heads as high as 40 m
- (iii) High lift centrifugal pumps employed to deliver liquids at heads above 40 m.

#### 3. Liquid handled:

- (i) Closed impeller pump
- (ii) Semi-open impeller pump (or Non-clog pump)
- (iii) Open impeller pump.

#### 4. Number of impellers per shaft:

- (i) Single stage centrifugal pump ... has one impeller, usually a low lift pump.
- (ii) Multi- stage centrifugal pump ... has two or more impellers and pressure is built in steps; used usually for high working heads and the number of stages depends on the head required.

5. Number of entrances to the impeller:

- (i) Single entry or single suction pump water is admitted on one side of the impeller.
- (ii) Double entry or double suction pump water is admitted from both sides of the impeller; axial thrust is neutralised employed for pumping large quantities of fluid.

6. Relative direction of flow through impeller:

- (i) Radial flow pump ... normally radial flow impellers are used in all centrifugal pumps
- (ii) Axial flow pump designed to deliver huge quantities of water at comparatively low heads; ideally suited for irrigation purposes.
- (iii) Mixed flow pump ... mostly employed for irrigation purposes.

