HYDRAULIC TURBINES —DEFINITION

The hydraulic turbine is a prime mover that uses the energy of flowing water and converts it into the mechanical energy in the form of rotation of the runner. (A prime mover is a machine which uses the raw energy of a substance and converts it into the mechanical energy.) Since the fluid medium is water, these turbines are also known as the ‘water turbines’. Hydraulic turbines coupled with hydro — generators form the so —called ‘hydrounits’ which are widely used now a days for generating electrical power.

CLASSIFICATION OF TURBINES

Hydraulic turbines may be classified in the following ways:

i) According to the type of energy at inlet.
   a) Impulse turbine
   b) Reaction turbine.

ii) According to the direction of flow through runners.
   a) Tangential flow
   b) Radial flow
   c) Axial flow
   d) Mixed flow turbines.

iii) According to the head and quantity of water
   a) High head turbines —which work under high heads (above 250m) but with less
quantity of water.

Example: Pelton wheel

b) Medium head turbines — work under medium heads (60m to 25m) — they require relatively large quantity of water. Example: Francis turbines

c) Low head turbines — work under heads less than 60m — they require a very large quantity of water.

Example: Kaplan turbine

iv) According to position of shaft

a) Horizontal turbines — These turbines have horizontal shafts.

Example: Pelton wheel

b) Vertical turbines — These turbines have vertical shafts.

Example: Francis and Kaplan turbines.