

## Section 7.6

Q1 Explain the principle of conversion of solar energy into heat. Explain a flat plate solar collector.

Ans) Principle: When solar radiation from the sun comes in the form of light [a short wave radiation] to the earth, visible sun's radiation is absorbed on the ground and transformed into heat energy. The material becomes warm and stores the heat, conducts it to surrounding materials [air, water, other solid or liquids], or radiates it to other material of lower temperature.

(6) Flat plate collector:-

(i) Flat plate collector is simplest in design and it is most important part of any solar thermal energy system.

(ii) In this collector both direct and diffuse radiations are absorbed and converted into useful heat.

(9) Components of flat plate collector:-

(i) Absorbed plate

(ii) Transparent covers

(iii) Insulation

(iv) Box.

(i) Absorbed plate: Absorbed plate is used to grasp and absorb solar radiation.

(b) The plate is usually metallic [Copper, aluminum or steel], some things plastics have been used in some low temperature applications.

(ii) Transparent covers: These are one or more sheets made of glass for trapping the heat received by the absorbed plate. It helps in reducing the convection, radiation heat losses.

(iii) Insulation: It minimizes the heat losses by conduction.

(iv) Box: It contains the above components and keep them in to desired position.  
Transparent cover

