

SECTION-A

Q. No. 1)

Ans:

(1) Following the basic principle of OTEC

- (i) The principle of ocean thermal energy conversion (OTEC) is that there is the temperature difference between water at the bottom of the sea and the at the top.
- (2) This temperature difference can be used to operate or heat engine and most of the radiation is being the absorption at the surface layer of water.
- (3) The mixing between hot and cold water is prevented because natural convection ocean between hot and cold water layer.
- (4) ~~Thus~~ Therefore it is essential to connect the non-reachable heat engine between source and cold sink to produce work that can be converted into required application.

(5) ~~The~~ The absorption of solar radiation in the water varies and can be expressed by Lambert's Law.

$$-\frac{dI_y}{dy} = \mu I_y$$

or,

where, $I_y = I_0 e^{-\mu y}$

I_y = Radiation intensity at depth y from water

I_0 = Radiation intensity at water surface

μ = Extinction or absorption coefficient

(2) OPEN OTEC cycle

(1) In this system, the warm water from ocean surface is admitted through a reactor to the flash evaporator which is maintained under high vacuum.

(2) As a result a low pressure steam is generated due to throttling effect and the

The water under liquid is dis charge back to the ocean at high depth

(3) The deaerator also removes the dissolved non-condensable gases from water and helps surface to the evaporator.

(4) The mixture of cold deaerated steam and ocean cold water or dis charges into the ocean.

