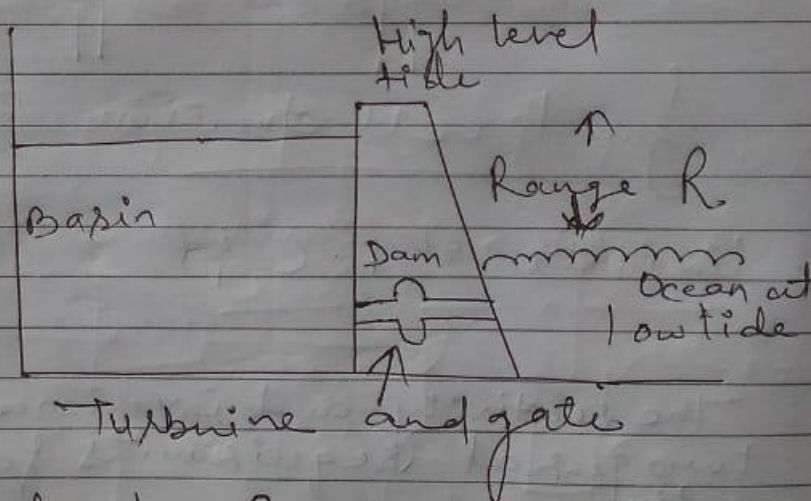


Section - 1

5.4 Methods of Tidal power generation \rightarrow 1. Single Basin System \rightarrow

In a tidal Power plant, the power house is situated at the mouth of Basin.



Single basin system.

R = Tidal range m = mass flowing

W = work done, A = surface

H = Intermediate head

dH = small head

g = Gravitational constant.

ρ = Density of water

$$dw = gH dm$$

But $dm = -\rho A dH$ (\because Density = $\frac{\text{Mass}}{\text{Volume}}$)

$$dw = -\rho A g H dH$$

Total work during emptying of filled basin,

$$W = \int_R^0 dw = \int_R^0 -\rho A g H dH$$

$$W = \frac{1}{2} \rho A R^2$$

$$W \propto R^2$$

$$\text{Average Power (P}_{\text{avg}}) = \frac{W}{t}$$

$$t = 6 \text{ h } 12.5 \text{ min} = 22350 \text{ sec.}$$

$$\frac{P_{\text{avg}}}{A} = \frac{1}{44700} \times 9.8 \times 10^2 R^2 =$$

$$0.2247 R^2 \text{ W/m}^2$$