SECTION=5

Q.1 ⇒ Method of tidal power generation ⇒

Answer ⇒

↳ To utilize tidal energy, water must be trapped at high tide behind dam or barrage and then made to drive turbine as it returns to sea during low tides.

* Components of Tidal power plant ⇒

↳ It is the main components of tidal power plant given below ⇒

(a) Barrage
(b) Sluice gates
(c) Turbine
(d) Basin

(a) Barrage ⇒

↳ Less steepy towards the ocean and basin side
↳ It should be able to withstand the shock load of tides and wave.
↳ To low height and shorter in length to minimize the cost of construction.

(b) Sluice Gates ⇒ These gates are opened by water pressure and no mechanical means is required.

(c) Turbine ⇒

↳ The Kaplan or bulb type turbine is used to operate with low head and the entire turbine generator unit is submerged in the water.

(d) Basin ⇒

↳ The basin can be single, pair or multiple type and have different designs.

* Working of Tidal power plant ⇒

↳ The working is described according to the type of basins.

(a) Single basin system
(b) Double basin system

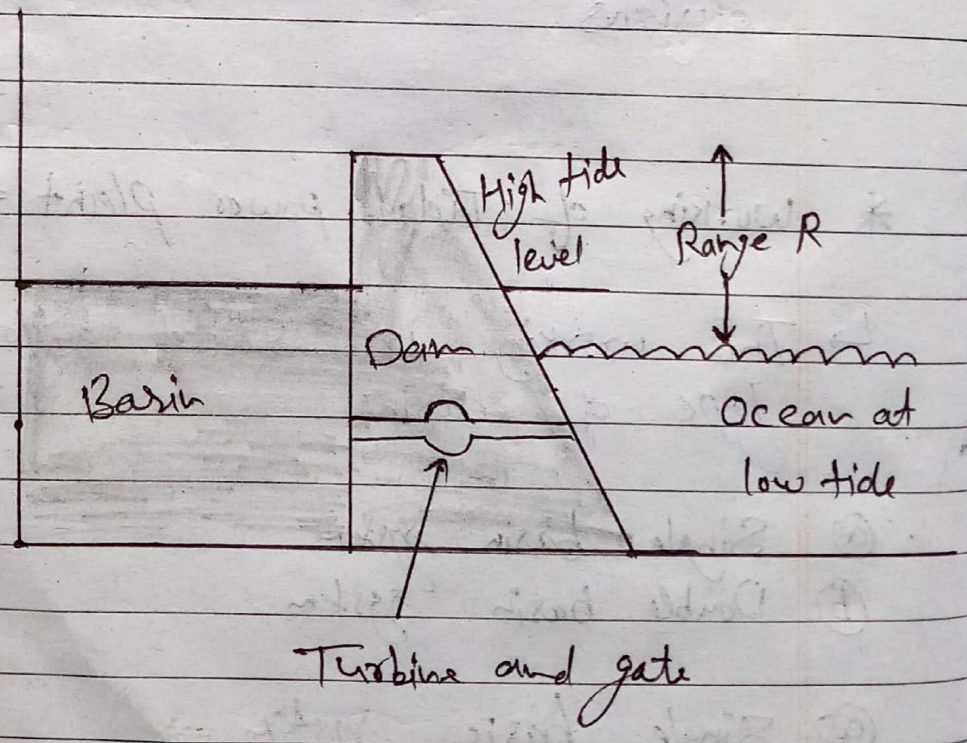
(a) Single basic system ⇒

↳ In a tidal power plant (based on single basin system), the power house

is situated at the mouth of basin.

↳ The hydraulic turbine in the power house only operates during the discharge of water from the basin during ebb tide and during the high tide the basin is again filled.

↳ Further the power generation coincides occasionally with the peak power demands. The problem is overcome in double-basin system.

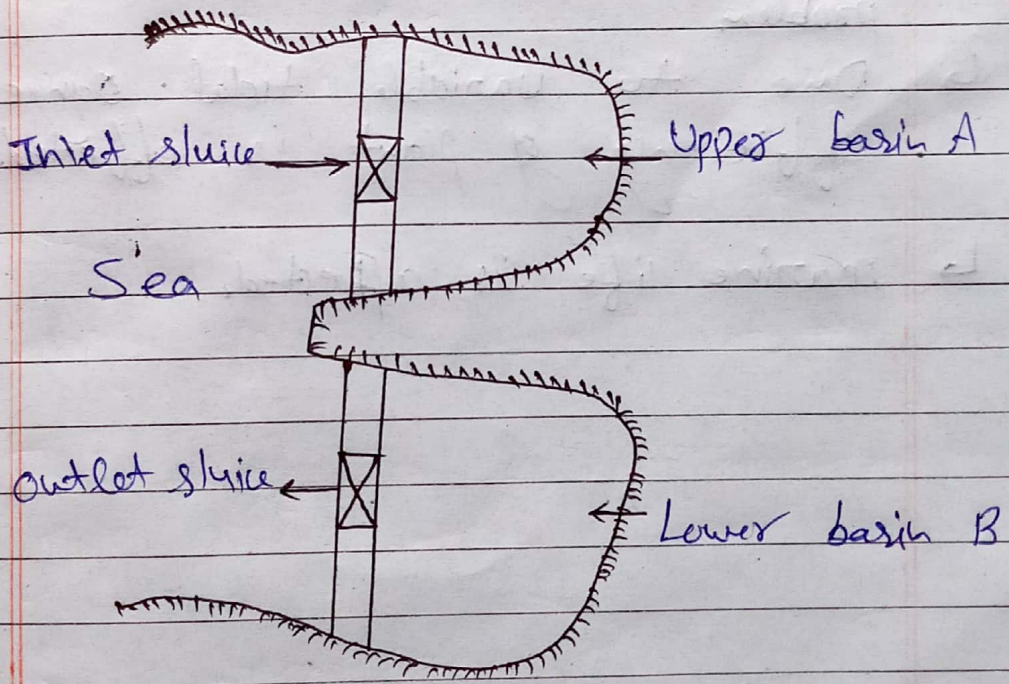


[fig. Single basin system]

(b) Double Basin System ⇒

↳ This system has two basins at different levels and a dam is provided in between these basin.

↳ Inlet and outlet sluice gates are provided in the dam and the water level in upper basin is maintained above the level of water in the lower basin.



[fig. Double basin system]

* Limitation of Tidal power :→

↳ Initial capital cost of plant is very high and needs long construction al period.

↳ Output power is variable due to uneven operation.

↳ Sea water is corrosive

↳ Sadimentation of basin is a serius problem.

↳ Due to variable tidal range, the efficiency of plant is effected.

↳ marine life is affected.