

Dec 13 (KUR)

Roll No. Total Pages : 04

BT-7/D-13 8747

HYDRO ELECTRIC POWER DEVELOPMENT

CE-413-E

Time : Three Hours [Maximum Marks : 75

Note : Attempt Five questions in all, selecting at least one question from each Unit. All questions carry equal marks. Assume any missing data.

Unit I

- 1. (a) Differentiate between firm power and secondary power. Also explain how the load forecasting is done ? 7.5
- (b) Load on a hydel plant varies from a minimum of 10,100 kW to a maximum of 35,100 kW. Two generators of capacities 22,000 kW each have been installed. Calculate total installed capacity, plant factor, maximum demand, load factor and utilization factor. 7.5

(1-22) L-8747

5

L-8747

E 4

5,000

8. (a) Differentiate between Single basin system and Double basin system in tidal power with neat diagrams. 7.5

(b) How to estimate energy and power in a tidal plant ? Explain with the equations. 7.5

E 4

2. (a) What are different basis of classifications of hydel power plants ? Explain them with proper data. 7.5
- (b) What do you understand by diversion canal plants ? Discuss its layout with sketches. 7.5

Unit II

3. (a) Why are conduit valves provided in a water conveyance system ? Discuss functioning of a needle and tube valves. 7.5
- (b) What do you understand by the term water hammer ? Explain rigid water column theory used in it. 7.5
4. (a) Discuss different methods of support of the penstocks used in hydro power projects with neat diagrams. 7.5
- (b) What are types and functions of a surge tank ? Describe the behaviour of a differential surge tank. 7.5

L-8747

2

Unit III

5. (a) Explain how to distinguish between different types of turbines on the basis of hydraulic features. 7.5
- (b) What are main features of Kaplan Turbine ? Explain them with a diagram. 7.5
6. (a) Derive a relation for calculating efficiency of a draft tube. 7.5
- (b) Discuss methods of design of spiral casing with sketch. 7.5

Unit IV

7. (a) What do you understand by superstructure in a powerhouse ? Explain variation in design of powerhouse superstructure in a hydro project. 7.5
- (b) Describe several locations and types of layouts of underground power stations with sketches. 7.5

(1-22) L-8747

3

P.T.O.