

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

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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

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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

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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

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P.T.O.