

Roll No. ....

Total Pages : 03

**BT-7/M-20**

**37048**

**HYDRO ELECTRIC POWER  
DEVELOPMENT  
CE-413E/CE-413N**

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. Assuming any missing data.

**Unit I**

1. (a) Discuss pros and cons of hydel power as compared to power obtained from other sources. 7½  
(b) Explain the difference between base load and peak load plants. For what type of conditions hydro electric power is very much suitable ? 7½
2. (a) What is hydro power development ? Give brief account of perspective power development vice versa power demand in the country. 7½  
(b) Define storage power development. Does it differ from run of river power development ? 7½

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## **Unit II**

3. (a) Discuss briefly different types of hydraulic valves used in penstocks with sketches. 7½  
(b) Why are conduit valves provided in a water convergence system ? Discuss functioning of a needle and you tube valves. 7½
4. What do you mean by water hammer pressure ? Find expression for it. Also discuss critically the different types of surge tanks. Mention design steps of simple surge tank as well. 15

## **Unit III**

5. (a) Explain types of draft tube. Derive a relation for efficiency of a draft to be used in turbine. 7½  
(b) What are the characteristics causes of francis turbine ? Explain them with diagram. 7½
6. (a) Determine number of turbine and diameter of runner for a power plant having 20 cumecs in flow, 10 m head, turbine efficiency 90% and speed, 55 rpm. Assume specific speed as 255 rpm and speed ratio as 0.9. 7½  
(b) Discuss method of design of spiral casing with sketch. 7½

#### **Unit IV**

7. (a) Define a power house. Elaborate the three parts of hydel power plant with neat sketch. 7½  
(b) Define an underground power house. Why and where construction of such plant is necessitated ? 7½
8. (a) What do you understand by various types of cavities essentially needed in underground power plant ? Explain them properly. 7½  
(b) What are the components of a double basin systems of a tidal power plants ? Explain its working with neat sketches. 7½