Roll No. .....
Printed Pages : 2

8748

BT-7/M-17

HYDRO ELECTRIC POWER DEVELOPMENT

Paper–CE-413 E

Time allowed : 3 hours] *[Maximum marks : 75*

Note :- *Attempt any five questions, selecting at least one question from each unit. All questions carry equal marks. Assume any missing data.*

Unit-I

1. (a) Discuss strength, weakness and future prospects of water power in India. 7.5

   (b) Two turbo generators each of capacity 20000 kW are installed in a hydro power project. The load on hydro plant varies from 10000 to 40000 k W. Calculate total installed capacity, load factor, plant factor and utilization factor. 7.5

2. (a) Enumerate relative merits and demerits of two unit and three unit arrangements of pumped storage plants. 7.5

   (b) Explain with sketches general arrangement of run off river plants. Discuss limitations in each case. 7.5

Unit-II

3. (a) What are the functions of intakes? Draw labeled diagrams of a typical cage shaped intake. 7.5

   (b) A stone gate 9.2m x 6.2m has submerged weight 32 metric ton has to operate at a load of 22 meter. If the gate travels at a maximum speed of 1.1 meter/min, find the HP required to operate the gate if overall efficiency is 80% and FOS is 2.2. Take coefficient of rolling friction 0.004 and 5% of water load for bearing friction. 7.5

http://www.kuonline.in

4. (a) How do you classify penstocks? Explain them with neat diagrams. 7.5

   (b) What do you understand by water hammer in the pipe line? Derive an expression for water hammer pressure in case of a rigid pipe and in case of elastic pipe. 7.5

Unit-III

5. (a) Write down steps in design of runner of a Francis turbine. 7.5

   (b) What is a draft tube? What are its types and their functions? How to estimate efficiency of a draft tube? 7.5

6. (a) A hydraulic turbine has an output of 6600 kW when it works under a head of 28 m and runs at 110 rpm. What is the type of turbine? What would be its speed and what power will it develop when working under a head of 18m. 7.5

   (b) What do you mean by abrasion in a turbine? How does it take place? How this can be minimized in the turbines? 7.5

Unit-IV

7. (a) What are three major division of power house structures? Elaborate machine hall design and layout. 7.5

   (b) What are advantages of an under ground power house? Make a comparison with surface power house. 7.5

8. (a) Discuss the environmental concerns due to a tidal power plant. 7.5

   (b) What are the components of a single basin system of a tidal power plant? Explain its working with neat sketches. 7.5

http://www.kuonline.in