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320679(20)

B. E. (Sixth Semester) Examination, Nov.-Dec., 2019

(New Scheme)

(Civil Engg. Branch)

WATER POWER ENGINEERING

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : *Attempt all questions. Part (a) of each question is compulsory carrying 2 marks each. Solve any* *two* *from (b), (c), (d) carrying 7 marks each.*

Unit-I

1. (a) Define Water Power?

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(b) Write difficulties in development of hydropower project.

(c) Write advantages and disadvantages of :

(i) Hydropower

(ii) Thermal power

(d) What is the relation between water power and Hydrology.

Unit-II

2. (a) Define Design Flood.

(b) Following records of average yearly flow in a river for 15 years if the available head 15 m. Construct the flow duration curve and the power duration curve :

No.	Year	Flow
1	1986	900
2	1987	870
3	1988	1060
4	1989	1110
5	1990	680

6	1991	710
7	1992	850
8	1993	780
9	1994	600
10	1995	620
11	1996	810
12	1997	890
13	1998	1025
14	1999	1160
15	2000	930

(c) A common load is shared by two stations, one being a base load plant with 25 MW installed capacity and the other being a stand by with 30 MW capacity. The yearly output of the standby is 10.5×10^6 kWh and that of the base load plant is 125×10^6 kWh. The peak load taken by the standby is 15 mW working for 2500 hours during the year. The base load station takes a peak of 22.5 MW.

Find the : https://www.csvtuonline.com

(i) annual load factors for both stations.

(ii) plant use factors for both stations

(iii) capacity factors for both stations.

(d) Write short note on : (any two)

(i) Storage and Pondage

(ii) Pondage factor and Load factor

(iii) Utilization factor and capacity factor

Unit-III

3. (a) Write different types of hydro power plant.

(b) With a neat sketch explain the various components of a pumped storage power plant. Also mention the advantages of such a plant.

(c) A 100 MW reversible pump turbine has to work under a head of 400 m. Choose a suitable specific speed and running speed for the machine.

(d) Write short note on :

(i) run off river plant

(ii) hydro electric power from oceans.

Unit-IV

4. (a) Define water hammer.

(b) A penstock with an internal diameter of 1.2 m supplier water at a head equivalent to 17.6 kg/cm². There is a possibility of 20% increase in the pressure due to transient conditions. The design stress and the efficiency of the joint may be assumed to be 1020 kg/cm² and 85% respectively. Calculate the required wall thickness of the Penstock approximately.

(c) Write neat sketches explain :

(i) Restricted orifice surge tank

(ii) Conals

(d) Define Penstock. And also explain design criteria for Non-embedded Penstocks.

Unit-V

5. (a) Write three main divisions of power house structure.

(b) With a neat sketch explain location of underground power station. Also write advantages of under ground power house.

(c) With a neat sketch explain different types of layout of underground power stations.

(d) Explain general layout of power house with a neat sketch.