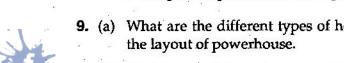
- (b) What are the advantages and disadvantages of underground power house? Explain in detail. 10
- 9. (a) What are the different types of houses? Describe the layout of powerhouse.
 - (b) Derive a relation between LF, PF, and UF. Differentiate between base pp load and peak pp



Roll No.

24515

B. Tech 7th Sem. (Civil Engineering)

Examination – June, 2016

HYDROPOWER ENGG.

Paper: CE-451-F

Time: Three Hours

[Maximum Marks: 100

Before answering the question, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note: Ouestion Number 1 is compulsory. Attempt one question from each Section. All questions carry equal marks. Attempt five questions in all. Assume missing data, if any, suitably.

- 1. (a) What do you mean by firm power and secondary power?
 - (b) Describe basic features of hydropower plants.
 - (c) Explain the purposes of draft tube in the turbines.
 - (d) What are the inherent advantages of water power?
 - Briefly describe the role of hydro-power in power $5 \times 4 = 20$ system.

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SECTION - A



- 2. (a) What do you mean by load on hydro-power stations? Explain the load duration curve with the help of graph. Also mention its significance. 10
 - (b) The load on a hydel plant varies from 8000 KW to a maximum of 36000KW. The two turbo generators are installed, each having the capacity of 20000 KW. Calculate the following:
 - (i) Load factor
 - (ii) Capacity factor
 - (iii) Utilization factor
 - (iv) Plant factor
 - (v) Maximum demand
- 3. (a) Describe the merits and demerits of Hydro-power w.r.t. other sources of power.
 - (b) Explain the load duration curve with diagram. What are the uses of load duration curve?

SECTION - B

4. (a) The runoff river hydropower plant has inflow of 30 cumecs and it works on head of 50 m with a provision for pondage to meet daily demand with load factor of 75%. Determine the power generation capacity of plant at 85% overall efficiency. What amount of pondage is needed if

(2)

- the plant operates at the peak station for six hours?
- (b) What do you mean by "run of river plants"?

 Describe the general layout of run of river plants.
- 5. (a) What are the different types of pump storage plants? Describe reversible turbines and cavitations in turbines.
 - (b) Differentiate between thermal power and hydropower. Explain the methods for prediction of loads.

SECTION - C

6. Describe the following:

20

- (i) Anchor blocks
- (ii) Types of valves
- (iii) Water hammer
- (iv) Classification of penstocks
- 7. (a) Describe surge shafts and its types. Briefly explain the design of surge shaft.
 - (b) What do you mean by penstock? Describe the design criteria of penstocks.

SECTION - D

8. (a) What are the different types of turbines? Describe the general criterion for the selection of turbine. 10

(3)

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