

Roll No.

24515

B. Tech. 7th Semester (Civil Engineering)

Examination – May, 2019

HYDROPOWER ENGINEERING

Paper : CE-451-F

Time : Three Hours] [Maximum Marks : 100

Before answering the questions, 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 : Attempt *five* questions in all, selecting *one* question from each Section. Question No. 1 is *compulsory*. All questions carry equal marks.

- 1. (a) Describe the advantages of hydropower. 4
- (b) Define the terms "Storage" and "Pondage" related to hydropower station. 4
- (c) What do you mean by firm power and secondary power? 4

24515-1,100-(P-4)(Q-9)(19)

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- (d) Write down advantages of underground power houses. 4
- (e) Describe the purpose of draft tube in the turbines. 4

SECTION – A

- 2. (a) Describe the merits and demerits of Hydro-power w. r. t. other sources of power. 10
- (b) Explain the load duration curve with diagram. What are the uses of load duration curve? 10
- 3. (a) Define : 10
 - (i) Capacity of plant.
 - (ii) Load factor.
 - (iii) Utilization factor.
 - (iv) Plant factor.
- (b) What are the sources of Energy ? Explain the status of hydropower worldwide. 10

SECTION – B

- 4. (a) What do you mean by "run of river plants" ? Describe the general layout of run of river plants. 10

24515-1,100-(P-4)(Q-9)(19) (2)

(b) Describe hydropower stations in brief and classify them on the basis of load, head & hydraulic characteristics. 10

5. (a) What are pumped storage plants? 5

(b) Differentiate between storage & pondage. Draw neat sketch. 5

(c) Describe Reversible Turbines and Cavitation in turbines. 10

SECTION - C

6. (a) What do you mean by Penstock? Describe the design criteria of penstock. 10

(b) What is surge shaft? Discuss its hydraulic design criteria. 10

7. Write short notes on : 4 x 5 = 20

(i) Anchor Blocks

(ii) Water hammer

(iii) Types of valves

(iv) Function of surge tank

SECTION - D

8. (a) What do you mean by specific speed of a water turbine? What information does it give and how it is made use in practice? Indicate how the form of a reaction turbine depends upon specific speed? 10

(b) Describe the general criteria for the selection of turbine. 10

9. (a) Draw a neat sketch of a power house and describe the main features of sub structure and super structure. 10

(b) Describe the advantages and disadvantages of underground power houses. 10

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