

M. TECH.-III (CIVIL-HYDRAULIC ENGINEERING) (CBCS – 2015 COURSE) : WINTER - 2017

SUBJECT : ELECTIVE-II – (A) WATER POWER ENGINEERING

Day : **Thursday**
Date : **18/01/2018**

Time : **11.00 AM TO 02.00 PM**
Max. Marks : 60.

W-2017-2831

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the **RIGHT** indicate full marks.
- 3) Draw neat labeled diagrams **WHEREVER** necessary.
- 4) Answers to the two sections should be written in **SEPARATE** answer books.

SECTION-I

Q.1 Briefly explain the typical features of (a) Tidal Power Plant (b) Pumped storage Plants, (c) Wave energy Plants. **(10)**

OR

What is the need for prediction of future loads? Briefly explain the different methods followed for the estimation of future loads.

Q.2 Write short notes on : (a) Empirical Relations for the Estimation of runoff; (b) Use of long records of rainfall-runoff data for the estimation of design discharges; (c) Importance of low flow analysis for hydro-electric Projects. **(10)**

OR

Explain and compare the typical characteristics of (a) typical Dam intake, (b) Canal Intake and c) Tower Intake.

Q.3 Write short notes on : (i) Design of number of penstocks (ii) Economical diameter of penstock pipes **(10)**

OR

What are the functions of valves in Hydro-electric installations? List out the classification of different valves used according to their functions.

SECTION-II

Q.4 Write short notes on : (i) Resonance in Penstock (ii) Water surge in Hydrel. **(10)**

OR

List out the classification of surge tanks. Discuss and compare the characteristics of cylindrical and restricted orifice type of surge tanks.

Q.5 Draw typical layout of multi-jet reaction turbine and show important components. Discuss and compare the merits and demerits of single jet and multi jet reaction turbines. **(10)**

OR

Define and explain the following terms in case of turbines : (a) Specific speed, (b) Synchronous speed, (c) Runaway Speed, (d) Peripheral Coefficient

Q.6 List out the classification for the layout of Power Houses. Discuss their merits and demerits with the help of sketches. What are the functions of Main / machine hall? Comment on the design length, width and height of the Machine hall. **(10)**

OR

Discuss the favourable and unfavourable situations under which small hydro-electric Projects are considered.

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