M. TECH.-III (CIVIL-HYDRAULIC ENGINEERING) (CBCS – 2015 COURSE) : SUMMER - 2018

SUBJECT- ELECTIVE - II a) WATER POWER ENGINEERING

Day: **Thursday** Time: **11.00 AM TO 02.00 PM**

Date: **31/05/2018** **S-2018-3025** Max. Marks: 60

N.B.:

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Use of non programmable calculator is **ALLOWED.**
4) Both the sections should be written in **SEPARATE** answer books.
5) Assume suitable data if necessary.

SECTION-I

Q.1 Compare between **(10)**

i) High head & low head hydropower plant
ii) Firm power and secondary power

OR

Q.1 Describe with neat sketches **(10)**

i) High head diversion plant
ii) Pumped storage plant

Q.2 Explain with neat sketch flow duration curve? Explain its use in planning of hydropower project. **(10)**

OR

Q.2 Draw a typical section of intake structure? What factors are considered while locating intake. **(10)**

Q.3 Explain in brief classification of penstocks on the basis of **(10)**

i) Material of fabrication
ii) Method of their support

OR

Q.3 How can the pen stocks be strengthened to take care of higher pressures? How can the thickness of the penstock be calculated for particular design pressure? **(10)**

SECTION-II

Q.4 Describe in brief **(10)**

i) Resonance in penstock
ii) Water surge in penstock

OR

Q.4 Explain with a neat sketch **(10)**

i) Simple cylindrical surge tank and
ii) Differential surge tank.

Q.5 Design a Pelton wheel for following specification P = 16000 BHP, H = 380m, N = 750rpm, η = 86%, C_v = 0.985, K_u = 0.45 find wheel diameter, number of jets, size and number of buckets. **(10)**

OR

Q.5 Classify the turbine according to **(10)**

i) Energy at inlet
ii) Direction of flow
iii) Head
iv) Specific speed

Q.6 Describe and compare merits and demerits of power houses located under ground against power stations located on ground. Draw a typical layout of power station located on ground. **(10)**

OR

Q.6 Describe the favorable situations under which small hydropower stations are considered. Also state the bottlenecks in the development of small hydro projects. **(10)**

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