

B.Tech Sem – V (2007 Course) (Civil Engg.) : WINTER - 2018

SUBJECT: FLUID MECHANICS-II

Day: Thursday
Date: 29/11/2018

W-2018-2795

Time: 02.30 PM TO 05.30 PM
Max Marks: 80

N.B.:

- 1) **Q.No.1** and **Q. No.5** are **COMPULSORY**. Out of the remaining attempt **ANY TWO** questions from each section.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answers to both the sections should be written in **SEPARATE** answer books.
- 4) Use of non-programmable **CALCULATOR** is allowed.
- 5) Assume suitable data, if necessary and state its clearly.

SECTION-I

- Q.1**
- a) What is hydraulic radius and hydraulic depth in case of open channel flow? (05)
 - b) What are types drag? (05)
 - c) What is classification of bed slopes depending upon values of y_n and y_c ? (04)
- Q.2**
- a) State and explain the factors affecting Manning's roughness constant? (06)
 - b) Final rate of flow for rectangular channel 4m wide and depth of flow = 2.5m. The channel is having bed slope 1 in 4000. Take Chezy's constant $C = 55$. (07)
- Q.3**
- a) Draw a neat diagram showing profiles on steep slope. (06)
 - b) Write the steps for direct step method. (07)
- Q.4**
- a) Derive relation between sequent depths for hydraulic jump. (06)
 - b) Write the procedure for location of hydraulic jump. (07)

SECTION-II

- Q.5**
- a) Differentiate between reaction and impulse turbine. (05)
 - b) What is surge tank? (05)
 - c) What is priming of centrifugal pump? (04)
- Q.6**
- a) Explain velocity triangles at inlet and outlet of a vane. (06)
 - b) Water is flowing through a nozzle having dia. 50 mm. The head of water over center of nozzle is 50 m. Final force exerted by jet water on fixed plate striking normally. Take $C_v = 0.98$. (07)
- Q.7**
- a) What are performance characteristics of a turbine? (06)
 - b) Calculate diameter of jet and mean diameter of Pelton wheel working under following conditions. Power = 10,000kw, Net head = 500m, $N = 700$ rpm, $C_v = 0.98$, speed ratio = 0.45, overall efficiency = 95%. (07)
- Q.8**
- a) What is mechanical efficiency and overall efficiency of centrifugal pump? (06)
 - b) What NPSH in case of Centrifugal pump. (07)

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