Seat No.

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OCT-NOV 2025 WINTER EXAMINATION

1154 B.Tech. CBCS

Sub. Name: Fluid Mechanics-II

Sub. Code: 63347/79115/79403

Day and Date: Thursday ,04-12-2025 **Total Marks: 70**

Time: 10:30 AM To 01:00 PM

Instructions: **1. Assume suitable data wherever necessary and mention it boldly**
2. Draw neat labelled diagrams wherever necessary
3. Figures to the right indicate full marks

Special Inst.: **Attempt any THREE questions from each Section**

Q1) Solve **[11]**

a. Describe What is most economical channel section. State the conditions for most efficient Trapezoidal section. **[5]**

b. A channel is designed to carry a discharge of 20 m 3 /s with Manning"s n = 0.015 and bed slope of 1 in 1000 (for trapezoidal channel side slope M = 1√3). Find the channel dimensions of the most efficient trapezoidal section **[6]**

Q2) Solve **[12]**

a. What do you understand by critical, supercritical and sub critical flow in channel section? **[6]**

b. Water flows in a rectangular channel of width b=3 m with a discharge of Q=10 m3/s. The channel has a bottom slope of S0=0.001and Manning's roughness coefficient n=0.015. The channel is transitioning from y= 1 m to a depth y=0.75 m. here normal depth yn=1.5 m. Use the stepping method **[6]**

Q3) Solve **[11]**

a. Give the classification of hydraulic jump and their Froude number. **[5]**

b. A rectangular channel of width b=4 m carries water with a discharge of Q=20 m3/s. The flow depth before the jump y1 is 0.5 m. Determine, type of hydraulic jump and energy loss in the hydraulic jump. **[6]**

Q4) Write a Short Note on (Attempt any THREE) **[12]**

a. Open channel flow & Pipe flow

b. Specific energy curve with neat sketch

c. Direct Step Method of GVF computation

d. Surges in open channel- Positive and Negative Surge

e. M2 and S3 curve

Q5) Solve **[11]**

a. Write advantages of triangular notch over rectangular notch. **[5]**

b. A rectangular tank is 6 m long and 4m wide. It has a water depth of 2.5 m and is emptied through a rectangular notch of width b=1.2 m at the base of the tank. The discharge coefficient for the notch is Cd=0.62, Determine the time required to empty the tank completely. **[6]**

Q6) Solve **[12]**

a. Derive the equation for force exerted on Flat Fixed Plate, Jet impacting normal to plate. **[6]**

b. A jet of water with a diameter of 0.05 m strikes a flat vertical plate normally. The velocity of the jet is 25 m/s, and the density of water is 1000 kg/m3. Assume the jet is deflected by the plate without any loss of velocity. Determine, The force exerted by the jet on the plate and work done by the jet per second. **[6]**

Q7) Solve **[11]**

a. What is draft tube. What are its functions? **[5]**

b. What are the major components of Hydro-Power plant? Draw typical layout of Hydroelectric power plant **[6]**

Q8) Write a Short Note on (**Attempt any THREE**) **[12]**

a. NPSH

b. Ventilation of weir

c. End Contraction and Velocity of approach

d. Calibration of Notches and weir

e. Impulse momentum principle

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -
This Question Paper may be distributed for following Subjects as common code.
सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (101) Bachelor of Engineering (79403) Fluid Mechanics-II Part 2 SEM 4
2] (1154) B.Tech. CBCS (79115) Fluid Mechanics-II Part 2 SEM 4
3] (101) Bachelor of Engineering (63347) Fluid Mechanics-II Part 2 SEM 4