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Total No. of Pages : 3

Seat No.	

S.Y.B.Tech. (Civil) (Semester - IV) (CBCS) Examination, December - 2023

ESE-CV 404 : FLUID MECHANICS-II

Sub. Code : 79115

10607

Day and Date : Saturday, 30 - 12 - 2023 **Total Marks : 70**

Time : 2.30 p.m. to 5.00 p.m.

Instructions :
1) *Attempt any three questions from each section.*
2) *Q4 and Q8 are compulsory.*
3) *Figures to the right indicate full marks.*
4) *Assume suitable data if necessary and state them clearly.*
5) *Answer shall be supported by adequate sketches.*

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SECTION-I

Q1) Solve the following: **[11]**

a) What do you understand by open channel flow? **[5]**

b) A Wide rectangular channel carries discharge 2 m^3/s per meter width on bed slope 1 in 1800 find normal depth Take n=0.02 **[6]**

OR

c) Show that for most efficient trapezoidal channel **[6]**

$$b+2my=2y\sqrt{m^2+1}$$

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Q2) Solve the following: **[12]**

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

b) A wide rectangular channel carries discharge of 1.2 $m^3/s/m$, laid on bed slope of 1 in 3600. Determine the slope of water surface at depth of lm & mention the type of profile. Take n=0.02 **[6]**

OR

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P.T.O.

c) Show that: **[6]**

$$dx = \frac{\Delta E}{S_o - \bar{S}_f}$$

Q3) Solve the following: **[11]**

a) Give the classification of hydraulic jump **[5]**

b) Water is flowing non uniformly through a rectangular channel of 3 m width at a rate of 9.72 cumecs. At a particular section of the channel, the depth of flow is 0.8 m.

Determine whether a hydraulic jump will occur, and if so, find depth after jump. **[6]**

OR

c) What do you mean by spatially varied flow? Which are the assumptions made in differential equation of SVF. **[6]**

Q4) Write a short note on (Attempt any Three) **[12]**

a) Velocity distribution in open channel flow **[4]**

b) M2 and S3 curve **[4]**

c) Specific energy curve with neat sketch **[4]**

d) Hydraulic Jump as energy dissipater **[4]**

e) Surges in open channel-Positive and Negative Surge **[4]**

SECTION - II

Q5) Solve the following: **[11]**

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

b) In an experiment on a 90º V notch, the flow is collected in a rectangular tank having the cross section 0.8 × 0.6m. If the water level in the collecting tank changed from 0.8m to 1.8 m in 17.2 seconds when the head over the notch was 0.2m, estimate the coefficient of discharge for the notch. **[6]**

OR

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c) Show that the error in Discharge measurement due to error in measuring head over Triangular notch is given by **[6]**

$$\frac{dQ}{Q} = 2.5 \frac{dH}{H}$$

Q6) Solve the following: **[12]**

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

b) A 7.5cm diameter jet having a velocity of 30 m/sec strikes a flat plate, the plate normal is to jet. Find the normal pressure on the plate when the plate is stationary. **[6]**

OR

c) A jet of water of dia. 10cm strikes a flat plate normally with a velocity of 15m/sec. The plate is moving with a velocity of 6m/sec in the direction of the jet and away from the jet. Find **[6]**

i) The force exerted by the jet on the plate

ii) Work done by the jet on the plate per sec

Q7) Solve the following: **[11]**

a) Write difference between impulse Turbine and Reaction Turbine **[5]**

b) What are the advantages of hydroelectric power generation? **[6]**

OR

c) Draw a neat sketch of Francis turbine and explain the working of each component part **[6]**

Q8) Write a short note on (Attempt any Three) **[12]**

a) Ventilation of weir **[4]**

b) How notches are Calibrated in laboratory **[4]**

c) Impulse momentum principle **[4]**

d) NPSH **[4]**

e) Cavitation in pump and turbines **[4]**

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