SLOT: B2+TB2

REG. NO.: 24BCL0058

VIT
Vellore Institute of Technology

SCHOOL OF CIVIL ENGINEERING
CONTINUOUS ASSESSMENT TEST - II
FALL SEMESTER 2025-2026

Programme Name & Branch	: B.Tech – Civil Engineering
Course Code	: BCLE202L
Course Name	: Fluid Mechanics
Faculty Name(s)	: Dr. T. Shanmuga Priya
Class Number(s)	: VL2025260101133
Date of Examination	: 06.09.25
Exam Duration	: 90 minutes

Maximum Marks: 50

General instruction(s):

- Answer All Questions
- Course Outcome Statements:
  CO2: Measure the pipe flow discharge and major and minor losses.
  CO3: Analyse the practical significance of open channel flows

Q. No	Question	M	CO	BL
1.	A fluid flow is given by: $V= xy^2i - 2yz^2j - (yz^2 - \frac{2z^3}{3})k$. Prove that it is a case of possible steady incompressible fluid flow. Calculate the velocity and acceleration at the point (1,2,3)	10	CO2	3
2.	The water is flowing through a pipe of diameter 30 cm. The pipe is inclined and a venturimeter is inserted in the pipe. The diameter of venturimeter at throat is 15 cm. The difference of pressure between the inlet and throat of the venturimeter is measured by a liquid of sp. gr. 0.8 in an inverted U-tube which gives a reading of 40 cm. The loss of head between the inlet and throat is 0.3 times the kinetic head of the pipe. Analyse and find the discharge.	10	CO2	4
3.	A pipe of diameter 300 mm and length 1000 m connects two reservoirs, having difference of water levels as 15 m. Determine the discharge through the pipe. If an additional pipe of diameter 300 mm and length 600 m is attached to the last 600 m length of the existing pipe, find the increase in the discharge. Take f=.02 and neglect minor losses.	10	CO2	3
4.	A crude oil of viscosity 8 poise and specific gravity 1.2 flows through a horizontal pipe of diameter 120 mm. The maximum shear stress at the pipe wall is given as 186.2 N/m^2. Find (i) pressure gradient, (ii) average velocity, (iii) Renolds number, (iv) Power required per km of a line to overcome the viscous resistance to the flow.	10	CO2	4
5.	Find the rate of flow of water through a V-shaped channel having total angle between the sides as 60°. Take the value of C=50 and slope of the bed 1 in 1500. The depth of flow is 6 m.	10	CO2	3