

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2EXAMINATION- 2024

B.Tech-III Semester (CE)

COURSE CODE (CREDITS):23B11CE315 (3)

MAX. MARKS: 25

COURSE NAME: Fluid Mechanics

COURSE INSTRUCTORS: Ashish Kumar

MAX. TIME: 1 Hour30 Minutes

Note:(a)All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.No	Question	CO	Marks
Q1	Answer the following in brief.		
(a)	Differentiate between Laminar and Turbulent flow with suitable example. Which kind of flow exists in Rivers and streams?	CO-1	1
(b)	We have a circular pipe with varying diameter and we want to calculate the velocity at different sections of pipe. In your opinion, which equation will you apply for calculation? Briefly explain that equation with suitable example.	CO-4	2
(c)	For what purpose manometers are used?	CO-2	1
(d)	Differentiate between kinematic and dynamic viscosity.	CO-1	1
Q2	A flow equation is given by $\vec{v} = 2x^3i + 3x^2yj + 4ztk$. Is the flow steady or unsteady? Is the flow two or three dimensional? Make calculations for the velocity, acceleration of a fluid particle in this flow field at point P $(x,y,z) = (2,1,1)$	CO-3	6
Q3	The velocity potential function (ϕ) is given by an expression $\phi = 5(x^2 - y^2)$ Calculate the velocity components at the points (4,5). Also calculate the stream function (ψ).	CO-3	5
Q4	Explain the Venturimeter briefly with its principle. Why coefficient of discharge of Venturimeter is high in comparison of Orifice meter?	CO-4	2
Q5			
(a)	How hydrostatic forces are computed on curved surfaces submerged in liquid? Why it is not possible to compute forces directly using a single equation?	CO-2	2
(b)	A gate having curved surface (quadrant of a circle having radius 3 m) has been installed to hold the water over the Barrage. If water surface is 2 m above the gate, compute the force acting on the gate. Take width of the gate as Unity.	CO-2	5