JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2025

B.Tech-III Semester (CSE/IT/ECE/CE/BT/BI)

COURSE CODE (CREDITS):25B11CE313 (3) MAX. MARKS: 25

COURSE NAME: Fluid Mechanics

COURSE INSTRUCTORS: Ashish Kumar MAX. TIME: 1 Hour 30 Min

Note: *(a) All questions are compulsory.*
(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems
(c) Use of scientific calculator is allowed.

Q.No	Question	CO	Marks
Q1	A flat plate of area 1.5 x10^6 mm^2 is pulled with a speed of 1 m/s relative to another plate located at a distance of 0.15 mm from it. Find the force and power required to maintain this speed, if the fluid separating them is having dynamic viscosity as 0.1 Ns/m^2.	1	4
Q2	A pipe of 30 cm diameter conveys water 0.30 m^3/s of water has a right-angle bend in a horizontal plane. Find the resultant force exerted by water on the bend if pressure at inlet and outlet of the bend are 24.5 x 10^4 N/m^2 and 23.5 x 10^4 N/m^2	2	5
Q3 (a)	Differentiate between steady flow and unsteady flow with suitable example.	3	2
Q3 (b)	The two components of the velocity are given below, determine the third component if these components satisfy the continuity equation. $u = x^2 + y^2 + z^2$, $v = xy^2 - yz^2 + xy$	3	3
Q4	Explain the various conditions in flow system where Bernoulli equation cannot be applied.	4	3
Q5	Why we provide length of divergent cone more than length of convergent cone in Venturimeter ? Draw the neat diagram of Venturimeter & explain each part.	4	3
Q6	A venturimeter with throat diameter 15 cm was inserted in pipe having diameter equal to 30 cm to measure the rate of flow through the pipe. A differential manometer connected to the inlet and throat gives a reading of 22 cm. Calculate the discharge of water through the pipe. Take $C_d = 0.98$.	4	5