JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2025

B.Tech-III Semester (CE)

COURSE CODE (CREDITS):25B11CE313 (3)

COURSE NAME: Fluid Mechanics

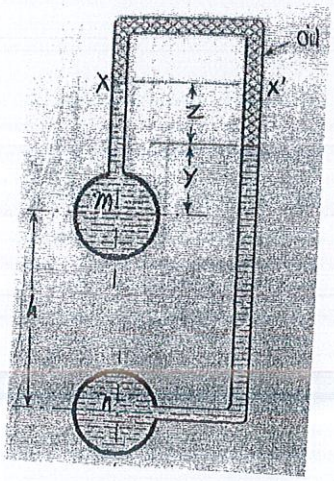
MAX. MARKS: 15

COURSE INSTRUCTORS: Ashish Kumar

MAX. TIME: 1 Hour

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(a)	Why does water rise in a glass capillary but mercury falls in the same tube? Explain the phenomenon.	1	1
Q1(b)	The velocity distribution for flow over a flat plate is given by $u = \frac{3}{4}y - y^2$ in which u is the velocity in m/s at a distance y m above the plate. Determine the shear stress at $y = 0.15$ m. Take dynamic viscosity of the fluid as 0.86 Ns/m^2	1	3
Q2 (a)	Why is mercury used in barometers instead of water?	2	1
Q2 (b)	A mechanic applies a force of 250 N on a small piston of area 0.02 m^2 in a hydraulic lift. If the larger piston has an area of 1 m^2, what weight of construction material can be lifted?	2	3
Q3	A circular plate made of steel having diameter 4.0 m is submerged vertically in the tank of oil having specific gravity 0.9. If centre of the plate is 5 .0 m below the free surface level of oil, find the total force acting on plate and position of centre of pressure.	2	3
Q4	Water fills the vessel shown in the figure and a portion of the connecting tub. If the manometric liquid is oil of specific gravity 0.9, find the difference in pressure intensity at point 'm' and 'n' when $h = 1.25$ m and $Z = 0.3$ m 	2	4