GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Fourth Semester Regular) Examinations, May – 2024

22BCVPC24004 – Fluid Mechanics

(Civil)

Time: 3 hrs | Maximum: 70 Marks

(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer ***ALL*** questions	CO #	Blooms Level
a. How does the viscosity of air vary with temperature?	CO1	K2
b. Explain atmospheric, gauge and vacuum pressures.	CO2	K2
c. Define continuity equation.	CO3	K1
d. State Bernoulli's equation.	CO4	K3
e. What is Hydraulic gradient line?	CO4	K2

PART – B **(15 x 4 = 60 Marks)**

Answer ***ALL*** questions	Marks	CO #	Blooms Level
2. a. An oil film of thickness 1.5 mm is used for lubrication between a square plate of size 0.9 m × 0.9 m and an inclined plane having an angle of inclination 20^0. The weight of the square plate is 392.4 N and it slides down the plane with a uniform velocity of 0.2 m/s. Find the dynamic viscosity of the oil.	8	CO1	K4
b. One Liter of crude oil weighs 9.6 N. Calculate its specific weight, density and specific gravity	7	CO1	K3
(OR)			
c. A body of weight 500N having surface area of 0.2 m^2 slides down a lubricated inclined plane making an angle 30^0 with the horizontal. The oil has viscosity of 10 poise and a body speed of 1 m/s, determine the film thickness of the oil required	8	CO1	K4
d. Explain about U-tube differential manometer and inverted U-tube differential manometer?	7	CO1	K2
3.a. Explain the term total pressure acting on a plane surface immersed in a fluid at any angle. Obtain an expression for this, and also for the corresponding depth of the centre of pressure	8	CO2	K3
b. Explain the working of manometers with neat sketch	7	CO2	K2
(OR)			
c. What is continuity equation? Give the applications.	7	CO2	K2
d. What are the practical applications of Bernoulli's equation? Explain it?	8	CO2	K3
4.a. Distinguish between: (i) Steady flow and un-steady flow (ii) Uniform and nonuniform flow (iii) Compressible and incompressible flow (iv) Rotational and irrigational flow	7	CO3	K3

	(v) Laminar and turbulent flow.			
b.	A horizontal venturi meter with inlet and throat diameters 30cm and 15cm respectively is used to measure the flow of water. The reading of differential manometer connected to the inlet and the throat is 20 cm of mercury. Determine the rater of flow. Take Cd= 0.98	8	CO3	K4
	(OR)			
c.	A Venturi-meter is provided to measure the water flowing through a horizontal pipe of 25 cm diameter. The throat of the venture- meter is 12cm. The pressure of water flowing through the pipe is 1.5 bar and the vacuum measured at the throat is 30 cm of Hg. Find the water flow rate through the pipe. Take C_d=0.975.	8	CO3	K4
d.	State and derive Bernoulli's theorem, mentioning clearly the assumptions underlying it?	7	CO3	K3
5.a.	What are the applications of Venturi meter? Explain the working principle of venturi meter.	8	CO4	K3
b.	What is mean by orifice? Classify the types of orifices.	7	CO4	K3
	(OR)			
c.	What are the different losses in flow through the circular pipes? Explain it.	7	CO4	K2
d.	Explain about Reynolds experiment with neat sketch.	8	CO4	K3

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