

**ANURAG Engineering College**

(An Autonomous Institution)

II B.Tech I Semester Supplementary Examinations, June/July-2024

**FLUID MECHANICS  
(CIVIL ENGINEERING)****Time: 3 Hours****Max. Marks: 60****Section – A (Short Answer type questions)****(10 Marks)****Answer All Questions**

	Course Outcome	B.T Level	Marks
1. Define Newton's law of viscosity.	CO1	L1	1M
2. Name the different manometers used for pressure measurement?	CO1	L1	1M
3. What is a rotational and irrotational flow?	CO2	L2	1M
4. What is Bernoulli's equation?	CO2	L2	1M
5. What is the difference between orifice and venturimeter.	CO3	L2	1M
6. Define velocity approach.	CO3	L1	1M
7. What is water hammer in pipes?	CO4	L2	1M
8. Define total energy line?	CO4	L1	1M
9. What is boundary layer separation?	CO5	L2	1M
10. Define laminar sub layer.	CO5	L1	1M

**Section B (Essay Questions)****Answer all questions, each question carries equal marks.****(5 X 10M = 50M)**

11. A) Discuss surface tension and capillarity. Derive expression for surface tension for a liquid droplet.	CO1	L2	10M
<b>OR</b>			
B) The right limb of a simple U tube manometer containing mercury is open to the atmosphere while the left limb is connected to a pipe in which a fluid of sp. gravity is 0.9 is flowing. The centre of the pipe is 12 cm below the level of mercury in the right limb. Find the pressure of fluid in the pipe if the difference of mercury level in the two limbs is 20cm	CO1	L3	10M
12. A) Derive Bernoulli's equation with necessary assumptions.	CO2	L3	10M
<b>OR</b>			
B) Explain elaboratively stream function, velocity potential and flow net.	CO2	L2	10M
13. A) Derive expression for rate of flow through venturimeter.	CO3	L3	10M
<b>OR</b>			
B) i) Derive expression for discharge over a rectangular notch. ii) Define notch, weir,nappe and crest.	CO3	L3	6M 4M
14. A) Derive Darcy-Wiesbatch equation.	CO4	L3	10M
<b>OR</b>			
B) The difference in water surface levels in two tanks, which are connected by three pipes in series of lengths 300m,170m and 210 m and of diameters 300mm,200mm and 400mm respectively, is 12 m. Determine the rate of flow of water if co- efficient of friction are 0.005,0.0052 and 0.0048 respectively, considering: i) minor losses      ii) neglecting minor losses.	CO4	L3	10M

15. A) Derive expression for energy thickness. CO5 L3 10M
- OR**
- B) i) Define laminar boundary layer, turbulent boundary layer, laminar sub layer. CO5 L2 6M
- ii) Discuss Magnus effect. 4M