



R18 Regulation

Subject code:2P3AD

# TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

## B.Tech III Semester Supplementary Examinations, December 2025

### FLUID MECHANICS

(CE)

Maximum Marks: 70

Date: 22.12.2025

Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
  2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
  3. Part B consists of 5 Units. Answer any one full question from each unit.
  4. Each question carries 10 marks and may have a, b, c, d as sub questions.

#### Part-A

All the following questions carry equal marks

(10X2M=20 Marks)

		Marks	CO	BTL
1	Define and differentiate absolute and gauge pressure.	2M	1	L1
2	State Newton's law of viscosity.	2M	1	L1
3	For what type of flow velocity potential exists. And prove it.	2M	2	L1
4	What is flownet?	2M	2	L1
5	What does Hydraulic gradient line represent?	2M	3	L1
6	What is vena contracta and where does it occur.	2M	3	L1
7	What is a siphon?	2M	4	L1
8	What is Darcy's equation?	2M	4	L1
9	Define boundary layer	2M	5	L1
10	What do you mean by drag and lift?	2M	5	L1

#### Part-B

Answer All the following questions.

(5X10M=50Marks)

		Marks	CO	BTL
11	State Newton's law of viscosity and give its application with Newtonian and Non-Newtonian fluids.	10M	1	L2
	OR			
12	A hydraulic press has a ram of 30 cm diameter and a plunger of 4.5 cm diameter. Find the weight lifted by the hydraulic press when the force applied at the plunger is 500N.	10M	1	L2
13	Explain stable, unstable and Neutral equilibrium of floating body and submerged body.	10M	2	L2
	OR			
14	Distinguish between: (i) Steady flow and un-steady flow, (ii) Uniform and nonuniform flow.	10M	2	L2

15	Explain the principle of venturimeter. Also derive the expression for rate of flow using a venturimeter when there is a flow through a pipe line.	10M	3	L2
OR				
16	What are the surface and body forces associated with fluid flow? How are they incorporated in Euler's equation?	10M	3	L2
17	Explain the phenomenon of water hammer. Obtain an expression for rise of pressure when the flowing water in a pipe is brought to rest by closing the valve gradually.	10M	4	L2
OR				
18	Explain with neat sketch the Reynold's experiment and define Laminar and Turbulent flow.	10M	4	L2
19	Find the displacement thickness, the momentum thickness and energy thickness for the velocity distribution in the boundary layer given by $u/U = 2 (y/\delta) - (y/\delta)^2$ .	10M	5	L2
OR				
20	Explain Boundary layer separation with a neat sketch. What are the conditions under which separation takes place?	10M	5	L2