R18 Regulation *Subject code:2P3AD*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Supplementary Examinations, June 2026

FLUID MECHANICS

(CE)

Maximum Marks: 70 Date: 18.06.2026 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	What is Pascal's law.	2M	1	L1
2	Give the position of centre of pressure with respect to centre of gravity in general. Also give the reason.	2M	1	L1
3	Define path line and streak line.	2M	2	L1
4	Define buoyancy.	2M	2	L1
5	Give any two assumptions of Bernoulli's equation.	2M	3	L1
6	How does a pitot tube works?	2M	3	L1
7	Define velocity of approach.	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 lift?	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	What do you understand by single column manometer? Derive the expression for pressure measurement (with help of neat sketches).	10M	1	L2
	OR			
12	An isosceles triangle of 4 m base and 6 m height is located vertically in the water whose height is parallel to free surface of water and its vertical height from free surface of water is 8 m. determine the pressure force acting on it and location of centre of pressure both vertically and laterally.	10M	1	L2
13	Determine whether the following velocity components satisfy the continuity equation. i) $u = cx, v = -cy$ ii) $u = -cx/y, v = c \log xy$	10M	2	L2
	OR			

14	Define the equation of continuity. Obtain the expression for continuity equation in three dimensions.	10M	2	L2
15	Explain the principle of venturi meter. Also derive the expression for rate of flow using a venturi meter when there is a flow through a pipe line.	10M	3	L2
	OR			
16	What are the applications of Momentum equation? Explain.	10M	3	L2
17	The difference in water surface levels in two tanks, which are connected by three pipes in series of lengths 300m, 170m, and 210m and of diameters 300mm, 200mm and 400mm respectively is 12m. 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.	10M	4	L2
	OR			
18	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
19	a) Differentiate local co-efficient of drag and average co-efficient of drag. b) What are the conditions for separation of boundary layer?	5M 5M	5	L2
	OR			
20	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