R20 Regulation *Subject code: 3P4CB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech IV Semester Supplementary Examinations, June 2026

FLUID MECHANICS AND HYDRAULIC MACHINES

(ME)

Maximum Marks: 70 Date: 10.06.2026 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	Define Specific gravity.	2M	1	L1
2	List the different types of Pressures.	2M	1	L1
3	Define Streak line.	2M	2	L1
4	State the Bernoulli's equation.	2M	2	L1
5	Define drag and lift.	2M	3	L1
6	List out Minor loses in Pipes.	2M	3	L1
7	What is mean by Turbines.	2M	4	L1
8	Find the force exerted by jet of water of diameter 30mm on a stationary flat plate, when the jet strikes the plate normally with a velocity of 10 m/s.	2M	4	L1
9	Define specific speed of a centrifugal pump.	2M	5	L1
10	What is mean by pump?	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	Briefly explain the physical properties of fluids with units.	10M	1	L2
	OR			
12	Explain U-tube manometers with neat sketch and find pressure in U- tube.	10M	1	L2
13	Derive Bernoulli's equation from Euler's equations of motions for a stream line.	10M	2	L2
	OR			
14	A 30 cm diameter pipe conveying water branches in to two pipes of dia 20cm and 15cm. If average velocity in 30cm diameter pipe is 2.5 m/s, find the discharge in this pipe and also determine the velocity of 15cm pipe, if the average velocity in 20cm dia pipe is 2m/s.	10M	2	L2
15	Explain Separation of Boundary layer with neat sketch.	10M	3	L2
	OR			
16	Find the head lost due to friction in a pipe of diameter 300 mm and length 50m, through which water is flowing at a velocity of 3m/s using: (i) Darcy formula, (ii) Chezy's formula for C=60. Take υ for water = 0.01stroke.	10M	3	L2

17	Derive the expression for force exerted by the jet on a stationary inclined plate.	10M	4	L2
	OR			
18	A Pelton wheel is working under a head of 45m and the discharge is 0.8m3/sec. The mean bucket speed is 14m/sec. Find the power produced if the jet is deflected by the blades through an angle of 165^0. The coefficient of velocity is 0.985.	10M	4	L2
19	Mention on which principle Centrifugal pump works. Explain the main parts of a Centrifugal pump with neat sketches.	10M	5	L2
	OR			
20	Draw and explain Reciprocating pump with neat sketch.	10M	5	L2