R20 Regulation *Subject code:3P4CB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech IV Semester Supplementary Examinations, July 2024

Fluid Mechanics and Hydraulic Machines

(ME)

Maximum Marks: 70 Date:20.07.2024 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 which carries 10M.
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)		CO	Bloom Tx
1	Define Specific gravity.	1	L1
2	Define specific volume.	1	L1
3	Define stream tube.	2	L1
4	Define boundary layer thickness.	2	L1
5	Write assumption in Bernoulli's equation?	3	L1
6	List out Minor losses in pipes.	3	L1
7	What is mean by Turbines.	4	L1
8	What is mean by impulse turbines?	4	L1
9	Define pump.	5	L1
10	Write the application of Reciprocating pump	5	L1
	Part-B		
Answer All the following questions. (5X10M=50Marks)			
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	Water flows through a pipe AB 1.2m diameter at 3 m/s and then passes through a pipe BC 1.5 m diameter. At C, the pipe branches. Branch CD is 0.8 m in diameter and carries one-third of the flow in AB. The flow velocity in branch CE is 2.5 m/s. Find the volume rate of flow in AB, the velocity in BC, the velocity in CD and the diameter of CE. (10M)	2	L2
	OR		
14	Derive Bernoulli's equation from Euler's equations of motions for a stream line. (10M)	2	L2
15	Explain Separation of Boundary layer with neat sketch. (10M)	3	L2

	OR		
16	Explain how Reynold's experiment could be useful to fluid Mechanics. (10M)	3	L2
17	Derive an expression for force exerted by the jet on a stationary unsymmetrical curved vane, strikes at tip of the vane. (10M)	4	L2
	OR		
18	Reaction turbine works at 450rpm under a head of 120m. Its diameter at inlet is 1.2m and the flow area is $0.4m^2$.The angle made by the absolute and relative velocities are 20° and 60° respectively with the tangential velocity. Determine 1).Volume flow rate, 2).Power developed. 3). Hydraulic efficiency. (10M)	4	L2
19	How do you Classify the pumps? (10M)	5	L2
	OR		
20	Explain Reciprocating pump with neat sketch. (10M)	5	L2