

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV/DEC 2025***Third Semester**Mechanical Engineering***CE3391 - Fluid Mechanics and Machinery***Regulations - 2021**Duration : 3 Hrs**Maximum : 100 Marks***PART - A (ANSWER ALL QUESTIONS) (Marks 10*2=20)**

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
1.	Define buoyancy.	L1	1	2
2.	List the applications of Bernoulli's equation.	L1	1	2
3.	Write down Darcy Weisbach equation for turbulent flow.	L1	2	2
4.	What are the losses experienced by a fluid when it is passing through a pipe?	L2	2	2
5.	Define the term 'Dimensionally Homogeneous equation' and give an example?	L1	3	2
6.	Define Mach number.	L1	3	2
7.	Differentiate axial flow and radial flow turbines.	L2	4	2
8.	Give an example for a low head turbine, a medium head turbine and a high head turbine.	L2	4	2
9.	What do you understand the term priming?	L2	5	2
10.	Define slip.	L1	5	2

PART - B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
11.	a i Explain the following terms: a. Density b. Weight density c. Specific volume d. Specific gravity of a fluid	L2	1	8
	ii What is a manometer? How are they classified? Or	L2	1	8
	b Derive Bernoulli's equation for the flow of an incompressible fluid.	L2	1	16
12.	a A crude oil of viscosity 0.97 poise and relative density 0.9 is flowing through a horizontal circular pipe of diameter 100 mm and of length 10m. Calculate the difference of pressure at the two ends of the pipe, if 100 kg of the oil is collected in a tank in 30 seconds. Or	L4	2	16
	b 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 coefficients of friction are 0.005, 0.0052 and 0.0048 respectively, considering: (i) minor losses also (ii) neglecting minor losses.	L4	2	16

13.	a	Torque T of a propeller depends upon density of liquid (ρ), viscosity (μ), speed (N), diameter of the propeller shaft (D). Using Buckingham's π theorem show that $T = \rho N^2 D^5 \phi[\mu/\rho N D^2]$.	L3	3	16
		Or			
	b	A pipe of diameter 1.5 m is required to transport an oil of specific gravity 0.90 and viscosity 3×10^{-2} poise at the rate of 3000 litre/s. Tests were conducted on a 15 cm diameter pipe using water at 20°C Find the velocity and rate of flow in the model. Viscosity of water at 20°C = 0.01 poise.	L3	3	16
14.	a	Explain the working and function of various main components of Pelton wheel turbine with neat sketch.	L2	4	16
		Or			
	b i	Explain the construction and working of Kaplan turbine with neat sketch.	L2	4	8
	ii	Explain the governing mechanism of Francis turbine.	L2	4	8
15.	a i	Explain the working of a single stage centrifugal pump with neat sketch.	L2	5	10
	ii	What are the effects of cavitation? Give the necessary precautions against cavitation.	L2	5	6
		Or			
	b i	Differentiate between single acting and double acting reciprocating pump.	L2	5	8
	ii	Explain the working principle of gear oil pump with neat sketch.	L2	5	8