Sanjay Ghodawat University, Kolhapur
Established as State Private University under Govt. of Maharashtra. Act No XL, 2017
2018-19
EXM/P/09/01

Year and Program:2018-19 **School of Technology** **Department of Civil Engineering**

Course Code: CET 202 **Course Title: Fluid Mechanics** **Semester – I**
Day and Date: Friday 07/06/2019 **End Semester Examination (ESE)** **Time:** 3Hrs. 2.30 to 5.30 PM
Max Marks: 100

Instructions: 1. All questions are compulsory.
2. Assume suitable data wherever necessary and mention it clearly.
3. Figures to the right indicate full marks.

		Marks	Bloom's Level	CO
Q.1	**Solve any Two**			
a)	Explain Newton's law of viscosity. Classify fluids and give practical examples..	07	L_3	CO1
	OR			
a)	An open tank contains water upto depth of 10 m and above it an oil of specific gravity 0.8 for depth of 5 m. Find the pressure intensity at 1) at interface of both liquids 2) at bottom of tank.	07	L_3	CO1
b)	A circular plate 3.0 m in diameter is immersed in water in such a way that its greatest and least depths below the free surface are 4 m and 1.5 m respectively. Determine total pressure on one face of the plate and position of the centre of pressure.	08	L_2	CO2
	OR			
b)	A 1 m wide and 1.5 m deep rectangular plane surface lies in water in such a way that its plane makes an angle of 30° with free water surface. Determine the total pressure and position of centre of pressure when upper edge is 0.75 m below free water surface.	08	L_2	CO2
Q.2	**Solve any Two**			
a)	Define following terms in detail: 1) Stream lines 2) streak lines 3) Stream tube 4) Path lines	07	L_3	CO3
	OR			
a)	If the diameters of pipe at sections AA and BB are 25 cm and 30 cm respectively, find the discharge through the pipe. The velocity of water at section AA is 4 m/s. Determine velocity at section BB.	07	L_3	CO3

ESE
Page 1/3

	b)	Explain working of Orifice meter.	08	L_3	CO4
		OR			
	b)	Write assumptions of Bernoulli's equation and state its practical examples.	08	L_3	CO4
Q.3		**Solve any Two**			
	a)	Explain following properties of fluids: 1) Unit weight 2) Mass density 3) Specific gravity	08	L_2	CO1
	b)	Write the conditions of stability for floating and submerged bodies.	08	L_1	CO2
	c)	Write properties of flow net.	08	L_1	CO3
	d)	Explain in detail how to determine hydraulic coefficients of orifice.	08	L_1	CO4
Q.4		**Solve any Two**			
	a)	Derive Darcy-Wiesbach equation for flow through circular pipe.	09	L_3	CO5
	b)	Oil of viscosity 0.1 Pa.s and specific gravity 0.90, flows through a horizontal pipe of 25 mm diameter. If the pressure drop per meter length of the pipe is 12 kPa, Determine, a. The discharge b. The shear stress at the pipe wall c. Raynold's number of the flow d. The power required per 50 m length of pipe to maintain the flow.	09	L_3	CO5
	c)	A pipe is 75 mm in diameter and 900 m long, carries water at a rate of 7 liter per second. If kinematic viscosity of water is 0.0195 stokes, check type of flow. Also determine loss of head.	09	L_3	CO5
Q.5		**Solve any Two**			
	a)	Write all formula for minor losses in pipes.	09	L_1	CO6
	b)	Write a note on working of siphon. Explain all parts of siphon.	09	L_3	CO6
	c)	Using Buckingham's π theorem show that Velocity through circular orifice is given by, $v = \sqrt{2gh}\ \phi\left[\frac{D}{H}, \frac{\mu}{\rho v H}\right]$ H – Head Causing flow, D- Diameter of an orifice, μ – Coefficient of	09	L_3	CO6

ESE

Dynamic Viscosity, ρ – Mass density, g – Acceleration due to gravity

Q.6 **Solve any Three**

a)	Write a note on Reynold's experiment and its use.	06	L_2	CO5
b)	Write various forms of Hazen-Poiseuille equation.	06	L_2	CO5
c)	Write importance and use of dimensional analysis.	06	L_2	CO6
d)	What is meant equivalent pipe? Derive Dupit's equation	06	L_2	CO6

*****

ESE

page 3/3