



B.Tech III Semester Supplementary Examinations, July 2024

**FLUID MECHANICS
(CE)**

Maximum Marks: 70

Date: 25.07.2024 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	What is Pascal's law?		1	L1
2	Define centre of pressure.		1	L1
3	For what type of flow velocity potential exists.		2	L1
4	What is flownet?		2	L1
5	List out the forces that are considered in Euler's equation		3	L1
6	What is vena contracta and where does it occur.		3	L1
7	What you mean by viscous flow		4	L1
8	Write Darcy formula for loss of head due to friction		4	L1
9	Define displacement thickness.		5	L1
10	What do you mean by drag lift?		5	L1

Part-B

Answer All the following questions.		(5X10M=50Marks)		
11	State Newton's law of viscosity and give its application with Newtonian fluids. [10M]		1	L2
OR				
12	A hydraulic press has a ram of 30 cm diameter and a plunger of 4.5 cm diameter. Find the weight lifted by the hydraulic press when the force applied at the plunger is 500N. [10M]		1	L4
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 venturimeter. Also derive the expression for rate of flow using a venturimeter when there is a flow through a pipe line. [10M]		3	L2

	OR		
16	What do you understand by kinetic energy correction factor ? Derive an expression for the same. [10M]	3	L2
17	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
	OR		
18	Explain with neat sketch the Reynold's experiment and define Laminar and Turbulent flow. [10M]	4	L2
19	a) What are the different methods of preventing the separation of boundary layers? [5M] b) Differentiate between Laminar boundary and turbulent boundary layer. [5M]	5	L2
	OR		
20	a) Draw a diagram for drag force on a plate due to boundary layer. [5M] b) Write down the boundary conditions for the velocity profiles. [5M]	5	L2