

7. (a) Explain the following : **12**  
 (i) Karman Vortex Trial  
 (ii) Separation of boundary layer.  
 (b) State Buckingham's theorem. **8**
8. (a) Drive an expression for various types of thickness of boundary layer. **10**  
 (b) A body of length 2 m has a projected area  $1.5 \text{ m}^2$  normal to the direction of its motion. The body is moving through water, which is having viscosity = 0.01 poise. Find the drag on the body if it has a drag co-efficient 0.5 for a Reynold number of  $8 \times 10^6$ . **10**

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**W-371**

**B. Tech. (Weekend)**

**EXAMINATION, Dec. 2017**

(Third Semester)

(Re-appear Only)

(CE)

CE-W-201

FLUID MECHANICS

*Time : 3 Hours]*

*[Maximum Marks : 100*

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Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

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**Note :** Attempt any *Five* questions. Assume any data if missing.

1. (a) Explain the following terms :

- (i) Compressibility
- (ii) Ideal Fluid
- (iii) Kinematic Viscosity
- (iv) Surface tension.

(b) What do you understand by Capillary Fall and Capillary Rise ? Derive the expression for them. **10**

2. (a) Derive an expression for surface tension on : **10**

- (i) Liquid droplet
- (ii) Liquid jet.

(b) Find the surface tension in a soap bubble of 30 mm diameter when the inside pressure is  $1.962 \text{ N/m}^2$  above atmosphere. **10**

3. (a) Define the following terms :

- (i) Poise
- (ii) Newtonian Fluid. **8**

(b) Differentiate between :

- (i) Simple and differential manometers
- (ii) Centre of gravity and centre of buoyancy. **12**

4. What do you understand boundary layer separation ? What is the effect of pressure gradient on boundary layer separation ? **20**

5. (a) How will you determine the metacentric height of a floating body experimentally ? Explain with neat sketch. **10**

(b) With neat sketches, explain stability for floating and submerged bodies. **10**

6. (a) What is Euler's equation ? How Bernoulli's equation can be obtain from it ? **10**

(b) Water is flowing through a pipe of dia. 100 mm under a pressure of  $19.62 \text{ N/cm}^2$  and with mean velocity of  $3.0 \text{ m/s}$ . Find the total head of the water at a cross-section, which is 8 m above the datum line. **10**