Roll No. | | | | | | | | | | | | |

Total No. of Pages : 02

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B.Tech. (ANE) (Sem.–3)

FLUID MECHANICS

Subject Code : ME-206

M.Code : 60538

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. Answer briefly :

a. What is specific gravity? How is it related to density?

b. State Pascal's law.

c. What is the difference between gauge pressure and absolute pressure?

d. State the Newton's law of viscosity.

e. Define Capillarity.

f. Mention any three applications of Bernoulli equation.

g. What are the different flow measurement techniques?

h. What is Buckingham Pi Theorem?

i. Classify different types of fluid flows.

j. What is Stream function?

SECTION-B

2. Derive the force on a curved surface due to hydrostatic pressure.

3. Derive the Bernoulli's equation.

4. Explain the difference between laminar and turbulent flows with examples.

5. What are the different types of flow measurement devices? Explain all in brief.

6. Derive continuity equation from basic principles.

SECTION-C

7. An oil of specific gravity 0.7 is flowing through a pipe of diameter 30 cm at the rate of 500 liters/sec. Find the head lost due to friction and power required to maintain the flow for a length of 1000 m. Take $\upsilon = 0.29$ stokes.

8. The velocity of water in a pipe of 200mm diameter is 5m/s. The length of the pipe is 50m. Find the loss of head due to friction, if $f = 0.08$.

9. The efficiency (η of a fan depends on ρ (density), μ (viscosity) of the fluid, ω (angular velocity), d (diameter of rotor) and Q (discharge). Express η in terms of non-dimensional parameters. Use Buckingham's n theorem.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.