**KMM 26122 FLUID MECHANICS IN CHEMICAL ENGINEERING**

**Problem SET-1**

1. What is a fluid? How does it differ from a solid? How does a gas differ from a liquid?
2. Define incompressible flow and incompressible fluid.
3. Define internal, external, and open-channel flows.
4. What is the no-slip condition? What causes it?
5. What is forced flow? How does it differ from natural flow? Is flow caused by winds forced or natural flow?
6. What is a boundary layer? What causes a boundary layer to develop?
7. What is a steady-flow process?
8. Define stress, normal stress, shear stress, and pressure.
9. What are system, surroundings, and boundary?
10. A 6-kg plastic tank that has a volume of 0.18 m3 is filled with liquid water. Assuming the density of water is 1000 kg/m3, determine the weight of the combined system.
11. The speed of an aircraft is given to be 260 m/s in air.

If the speed of sound at that location is 330 m/s, the flight of

aircraft is

1. Sonic (*b*) Subsonic (*c*) Supersonic (*d*) Hypersonic
2. If mass, heat, and work are not allowed to cross the boundaries of a system, the system is called

(*a*) Isolated (*b*) Isothermal (*c*) Adiabatic (*d*) Control mass

(*e*) Control volume