

ENGR 335

KEY WORDS AND STUDY QUESTIONS FOR CH 5

general extensive property	volume flow rate
general intensive property	discharge
control volume	mass flow rate
control surface	area average velocity
Reynolds transport theorem	mean velocity
system	unit outward normal vector
conservation of mass	
continuity equation	

1. Describe in words the meaning of the following two integrals.

(a)  $\frac{d}{dt} \int_{CV} N \rho dV$  where N is the number of Xenon molecules per kilogram of gas

(b)  $\int_{CS} N \rho \underline{V} \cdot d\underline{A}$  where N is the number of Xenon molecules per kilogram of gas

2. What principle is used to calculate the liquid level of a tank with one fill and one drain pipe? Make a sketch of the tank and write the equation you would use.
3. We have incompressible flow through a nozzle. The area average velocity at the entrance is known. What principle is used to determine the area average velocity at any point along the nozzle? Write the equation you would use.