**Chemical Engineering 374**

**Reading Questions 21—Chapter 11.1-11.6**

**Name** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. In calculating drag forces or lift forces for flow around 3-D objects, what “area” is usually used in the calculation?
2. In Example 11-1, is the computed drag coefficient applicable at all values of the Reynolds number?
3. When the shape of a blunt body is made more streamlined, how is each of the following affected (increased, decreased, or unchanged)?
   1. Pressure drag:
   2. Flow separation:
   3. Drag coefficient:
4. In creeping flow around a body, how much separation occurs?
5. For flow over a flat plate, how is the friction coefficient defined?
6. For flow over a flat plate, what technique is used when the boundary layer is laminar over part of the plate and turbulent over another part?
7. Under what circumstances can increasing surface roughness DECREASE drag on an object?