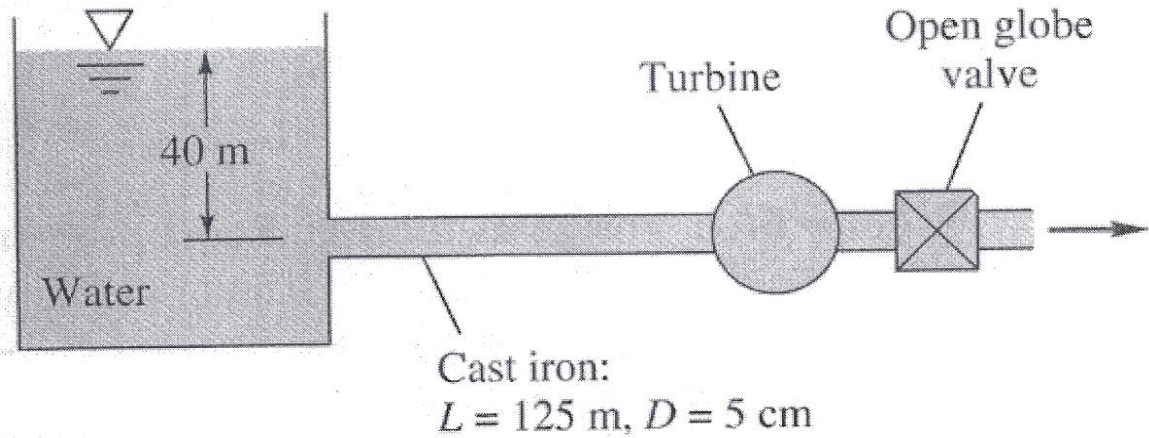
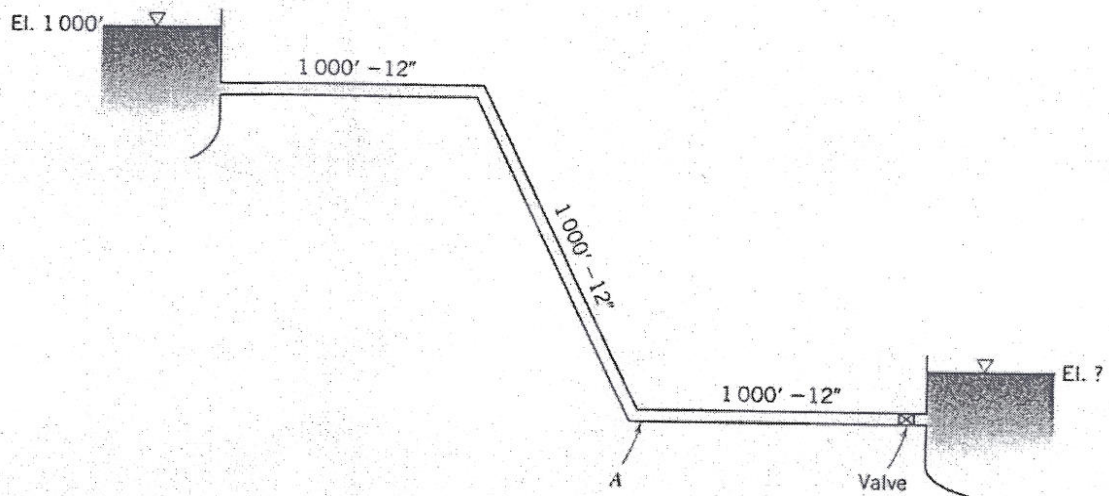


ENCE 3318
Fluid Mechanics for Civil Engineering
TEST 4

1. In the Figure below, the pipe entrance is sharp-edged. If the flow rate is $0.004 \text{ m}^3/\text{s}$, what power, in W, is extracted by the turbine?

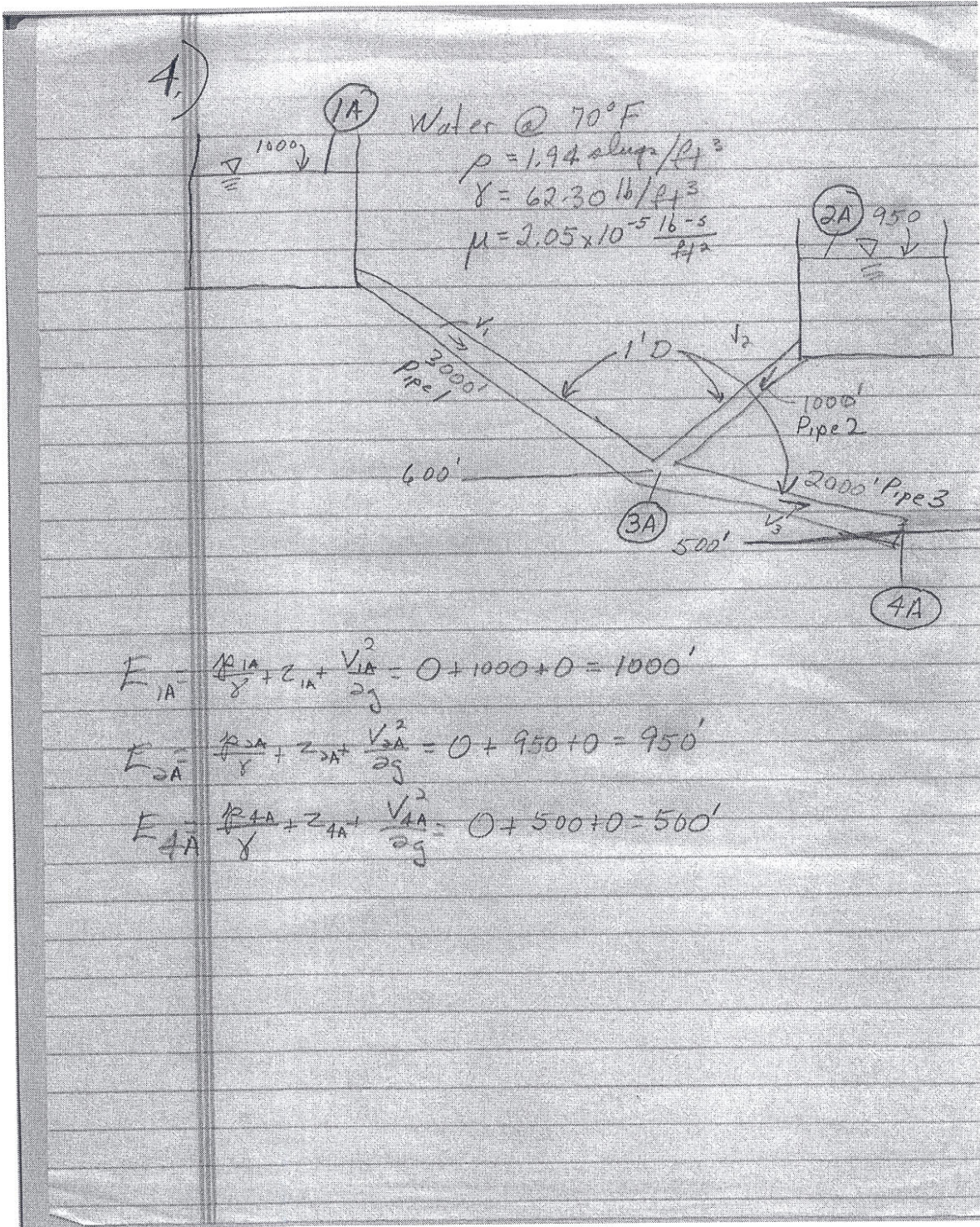


2. A concrete pipeline ($k_s = 0.12$ in.) 3000 feet long conveys water ($\nu = 1.1 \times 10^{-5}$ ft²/s) between two reservoirs. If the discharge is 3.0 cfs, find the elevation of the lower reservoir. A partially open valve near the lower reservoir has a loss coefficient of 6.0. The entrance loss coefficient is 0.3. Neglect minor losses for pipe bends. The diameter of the pipe is 12 inches.



3. A 3 in. Smooth pipeline 100 ft long carries 100 gpm of crude oil. Calculate the head loss when the oil is at (a) 80°F, (b) 110 °F.

4. Below is the two reservoir problem from class. Choose a pipe material that will work. Show all calculations.



5. With a total flow of 14 cfs, determine the division of flow and the head loss from A to B.

