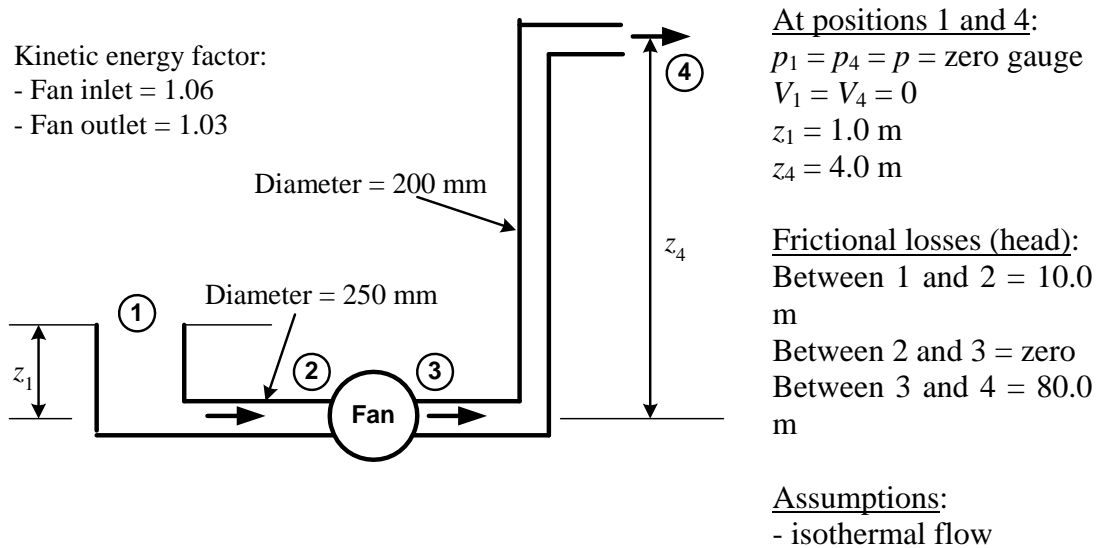


Exercise 01 – Fluid Network Analysis

(* For self-evaluation, no need to submit.)

1. Briefly describe the terms in the generalised Bernoulli equation and their physical meanings in fluid dynamics.

2. A fan-duct system with circular air ducts is delivering 200 litre/second of air from position 1 to position 4 as shown on the following diagram. Calculate the fan pressure required for the system by using two different methods (they shall produce the same results).
 - i) Apply the Bernoulli equation to positions 1 and 4 only.
 - ii) Apply the Bernoulli equation to positions 1 and 2, 3 and 4, and then 2 and 3.



3. To perform pipe network analysis, three basic principles of fluid mechanics are being used. Briefly describe each of them.

What are the three sets of equations commonly used for steady flow analysis of pipe network? Suggest one numerical/mathematical method that can be used for solving the network equations for the flow analysis.