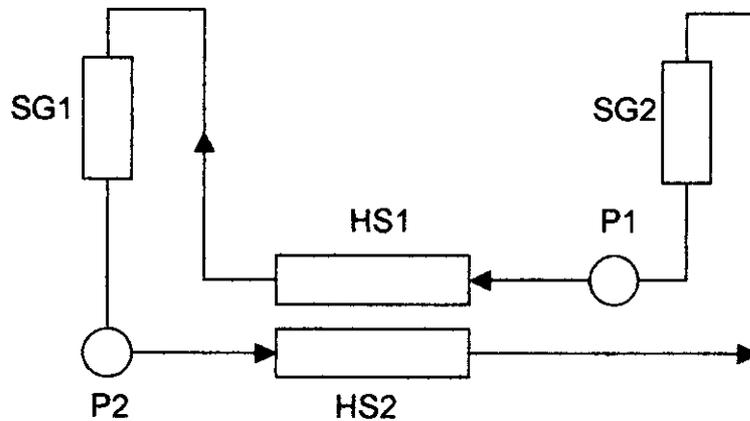


McMaster Nuclear Technology Diploma
 Course EP704
 Thermalhydraulics Analysis

Test 1

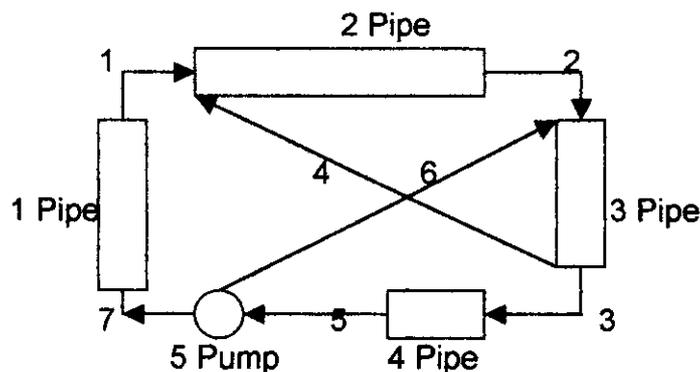
1. For the loop given below:



Write the appropriate equations for mixture energy conservation, using the macroscopic approach in a steady state mode. Consider simplifying the piping system by selecting one pipe component between heated sections (HS), steam generators (SG) and pump (P):

- Develop the energy equation in terms of enthalpy.
 - Develop the heat flux term using the Newton's law of convection heat transfer.
 - Develop the turbulent heating term via the added pump heat.
2. Explain the relationship between mass, momentum, and energy equations, and the equation of state. Also, explain the difference in the macroscopic and microscopic approach.

3. For the loop below:



Write the mass and momentum transient equations in matrix form (assume no elevation change between the nodes).