Unsteady flow in pipe networks

Exam questions

2015

1) MOC for slightly compressible fluids (constant sonic velocity)
   a) Internal point update
   b) Simple boundary conditions (pressure, velocity, total pressure)
   c) Pump as boundary condition: start-up and stop due to blackout.

2) MOC for open-surface flows
   a) Internal point update
   b) Simple boundary conditions (water level, velocity, flow rate).

3) Isentropic MOC
   a) Internal point update
   b) Simple boundary conditions (temperature, velocity, total temperature).

4) Lax-Wendroff scheme
   a) Main features, structure
   b) Boundary conditions implementation
   c) Comparison with isentropic MOC

5) Impedance technique
   a) Assumptions, theory behind (no derivation), aim of the technique (what kind of problems can be solved with it?).
   b) Boundary conditions.

6) Numerical techniques for
   a) solving systems of algebraic equations (Newton' technique)
   b) solving ODEs (explicit and implicit Euler, simple RK schemes) - stability, accuracy, stepsize selection