KSU – Chemical Engineering Department
ChE 304 (Thermodynamics) – TUT #5
Name: **ID:** **SN:**

1. Steam enters an adiabatic turbine at 10 MPa and 500 ^{o}C at a rate of 3 kg/s and leaves at 200 kPa. If the power output (work) of the turbine is 2000 kJ/s, determine the temperature of the steam at the turbine exit. Neglect kinetic energy changes.

2. Air enters the compressor of a gas-turbine plant at ambient conditions of 100 kPa and 25°C (h_1 = 298.2 kJ/kg) with a low velocity, and exits at 1 MPa and 347°C (h_2 = 628.1 kJ/kg) with a velocity of 90 m/s. The compressor is cooled at a rate of 1500 kJ/min, and the power input to the compressor is 250 kW. Determine the mass flow rate of air through the compressor.