1. Steam enters an adiabatic turbine at 10 MPa and 500 ^{o}C at a rate of 3 kg/s and leaves at 20 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 with a low velocity and exits at 1 MPa and 347°C 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.