

Problèmes pour TD4 à TD6 se trouvant seulement dans 5^{ème} édition du livre de Çengel et Boles

6-92 During an experiment conducted in a room at 25°C, a laboratory assistant measures that a refrigerator that draws 2 kW of power has removed 30,000 kJ of heat from the refrigerated space, which is maintained at -30°C. The running time of the refrigerator during the experiment was 20 min. Determine if these measurements are reasonable.

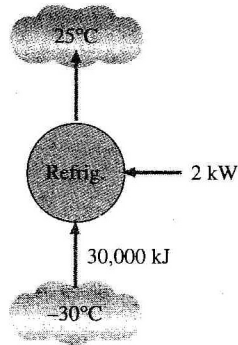


FIGURE P6-92

7-67 A 1.5-m³ insulated rigid tank contains 2.7 kg of carbon dioxide at 100 kPa. Now paddle-wheel work is done on the system until the pressure in the tank rises to 150 kPa. Determine the entropy change of carbon dioxide during this process. Assume constant specific heats. Answer: 0.719 kJ/K

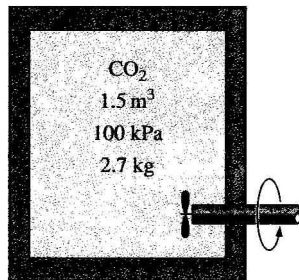


FIGURE P7-67

7-104 Steam enters an adiabatic turbine at 8 MPa and 500°C with a mass flow rate of 3 kg/s and leaves at 30 kPa. The isentropic efficiency of the turbine is 0.90. Neglecting the kinetic energy change of the steam, determine (a) the temperature at the turbine exit and (b) the power output of the turbine. Answers: (a) 69.1°C, (b) 3054 kW

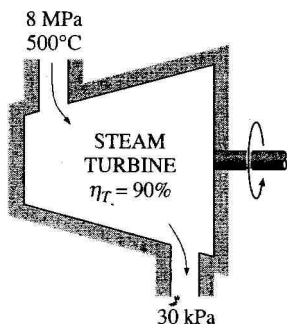


FIGURE P7-104

9-34 An ideal Otto cycle has a compression ratio of 8. At the beginning of the compression process, air is at 95 kPa and 27°C, and 750 kJ/kg of heat is transferred to air during the constant-volume heat-addition process. Taking into account the variation of specific heats with temperature, determine (a) the pressure and temperature at the end of the heat-addition process, (b) the net work output, (c) the thermal efficiency, and (d) the mean effective pressure for the cycle. Answers: (a) 3898 kPa, 1539 K, (b) 392.4 kJ/kg, (c) 52.3 percent, (d) 495 kPa

13-57 An equimolar mixture of helium and argon gases is to be used as the working fluid in a closed-loop gas-turbine cycle.

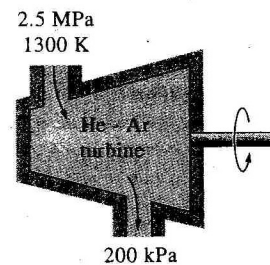


FIGURE P13-57

The mixture enters the turbine at 2.5 MPa and 1300 K and expands isentropically to a pressure of 200 kPa. Determine the work output of the turbine per unit mass of the mixture.