MSc Ist Year
June 2021
Thermodynamics and Chemical Reaction Engineering

Time 1.0 hrs MM 15

Q.1. Explain Graphically the difference between work done in case of reversible and Irreversible processes. (5)

Q.2. Air at 1 bar and 298.15 K is compressed to 9 bar and 298.15 K by two different closed-system mechanically reversible processes: (10)

(a) A constant volume process followed by a constant pressure process.

Calculate the heat and work requirements and ΔU and ΔH of the air for each path. The following heat capacities for air may be assumed independent of temperature:

$C_V = 20.785$ and $C_P = 29.100$ J· mol −1 ▪ K −1

Assume also that air remains a gas for which PV/T is a constant, regardless of the changes

it undergoes. At 298.15 K and 1 bar the molar volume of air is 0.04452 m3· mol−1.