

COURSE – THERMODYNAMICS AND STATISTICAL MECHANICS

PRACTICE SET – 2 (LAWS OF THERMODYNAMICS)

Date: 08-06-2017

- 1 A Carnot engine has the same efficiency between 1000K and 5000K and between xK and 1000K calculate x .
- 2 What work need to be done to compress 1 mole of ideal gas adiabatically from 6 litres to 2 litres? $C_v = \frac{3}{2}R$.
- 3 One mole of an ideal gas (di – atomic undergoes) adiabatic expansion from 25 to 50 L. the initial pressure is 1×10^5 Pa. calculate the work done by the gas on the surrounding.
- 4 Three moles of an ideal gas ($C_p = \frac{7}{2}R$) at pressure P_A and temperature T_A is isothermally expanded to twice its initial volume. It is then compressed at constant pressure to its initial volume. Finally the gas is compressed at constant volume to its original volume to its original pressure P_A . Calculate work done by the gas and net heat supplied to it during complete process.
- 5 Two moles of an ideal monoatomic gas initially at pressure P_1 and volume V_1 undergoes an adiabatic compression until its volume is V_2 . Then the gas is given heat Q at constant volume V_2 . Find total work done by the gas, total change in its internal energy and the final temperature of the gas.