

Thermodynamics



"I blame entropy."

<https://thepsyblog.wordpress.com/2015/01/23/complexity-2-two-interesting-properties-of-complex-systems/>

LOL

Quiz-I

3rd February 2023 || Time 40 Mins

1. For superheated steam kept at 150 kPa , $C_p = 2.07 + (T - 400)/1480 \text{ kJ/kg} \cdot ^\circ\text{C}$. What is the average value of C_p between 300°C and 700°C ? [1] 2.27
2. Show that for a Carnot engine $\eta_C = 1 - \frac{T_L}{T_H}$. If a Carnot engine operates between 250°C and 20°C and produces 15 kW work, how much heat is released in the sink? [3+1] 1.3
3. What is entropy? What is the physical interpretation of Helmholtz energy? Explain the parameters in the Van der Waals gas equation. [2+2+2]
4. For an ideal gas, which one is bigger, C_p or C_v , and by how much? Obtain the relation between the adiabatic exponent and quadratic degrees of freedom. [2+2]