Thermodynamics

"I blame entropy."

https://thepsyphilblog.wordpress.com/2015/01/29/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, $C_p = 2.07 + (T - 400)/1480$ kJ/kg $\cdot^{\circ}$ C. What is the average value of C_p between 300 $^{\circ}C$ and 700 $^{\circ}C$? [1]

2. Show that for a Carnot engine $\eta_C = 1 - \frac{T_L}{T_H}$. If a Carnot engine operates between 250 $^{\circ}C$ and 20 $^{\circ}C$ and produces 15 kW work, how much heat is released in the sink? [3+1]

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 quadretic degrees of freedom. [2+2]