1. Give English names for all of the elements in the first two periods of the periodic table.   10%

2. Give chemical formula for the following molecules: 15%
   Mercury(I) chlorides; Platinum nitrate; Vinyl chloride; Styrene; Acrylonitrile.

3. Estimate ΔE, q, w, ΔG and ΔS for an isothermal expansion of two moles of idea gas from 10 liter to 5 liter against a constant external pressure (P_{ex}) of 1 bar at 300 K. (25%)

4. Try to draw a schematic phase diagram (P vs T) for H_2O. Please indicate normal boiling point, normal melting point, critical point (200 atm and 650 K) and triple point on the diagram. 15%

5. $\Delta_{rxn}H^{\circ}$ of the reaction $2H_2 + O_2 \rightarrow 2H_2O$ is 570 kJ mol^{-1} at 300 K. Estimated $\Delta_{rxn}E^{\circ}$ of this reaction and the $\Delta_f H^{\circ}$ of water molecule at this temperature.   (10%)

6. Explain the reason of the following order in atomic radius reported in literature: (15%)
   H (32 pm) > He (50 pm) > Ne (70) > Li (152 pm)

7. For a zero order reaction of $A \rightarrow B$. The concentration of A at t = 0 is $[A]_0 = 1$ M and became 0.75 M at t = 1 s at 300 K. What are the rate constant (k) and the half time ($t_{1/2}$) of this reaction at this temperature? 10%