1) Since we can measure frequency, temperature, energy, we can measure the energy density with respect to frequency, $E(v)$, which contains the information of the value of $\hbar$ and $a$. 

As to photo gas, the particle number is not conserved, so the chemical potential is zero. Photo satisfies Bose-Einstein statistics, $a_v = \frac{2}{e^{\hbar v}-1}$, where $a_v$ is the averaged occupy number and energy level degeneracy; 2 comes from two polarizations. The energy density is $E(v)dv = a_v\hbar v g(v)dv$ where $g(v)$ is the density of states. $g(v)dv = \frac{4\pi v^2 dv}{(2\pi)^3/V(c/2\pi)^3} = V4\pi v^2 dv/c^3$. So, we can get

$$E(v) = \frac{8\pi V}{c^3} \frac{\hbar v^3}{e^{\hbar v/\beta} - 1} \quad (1)$$

After measuring the curve $E(v)$, we are able to know the value of $\hbar$ and $\beta$, then we should know the value of $\hbar$ and $k_B$. The Avogadro number is $R/k_B$.

2) The grand partition function $Z$.

$$\ln Z = -\int_0^\infty \ln[1 - e^{-\hbar v}]g(v)dv = \frac{8\pi V}{45} \left( \frac{k_B T}{\hbar c} \right)^3 \quad (2)$$

The entropy is $S = \frac{1}{\beta} \left( \frac{\partial Z}{\partial T} \right)_V$, the heat capacity is $c_V = T\left( \frac{\partial S}{\partial T} \right)_V = 4aVT^3$, where $a = \frac{8\pi^5 k_B^4}{15(\hbar c)^3}$. So, by measuring the heat capacity, we are able to know $\hbar$. 
Okay, looks correct.
Why was the third law of thermodynamics mentioned in part (b) of the statement of the problem?