1 Boltzmann probabilities

Consider a three-state system with energies $(-\epsilon, 0, \epsilon)$.

(a) At infinite temperature, what are the probabilities of the three states being occupied? What is the internal energy U? What is the entropy S?

(b) At very low temperature, what are the three probabilities?

(c) What are the three probabilities at zero temperature? What is the internal energy U? What is the entropy S?

(d) What happens to the probabilities if you allow the temperature to be negative?