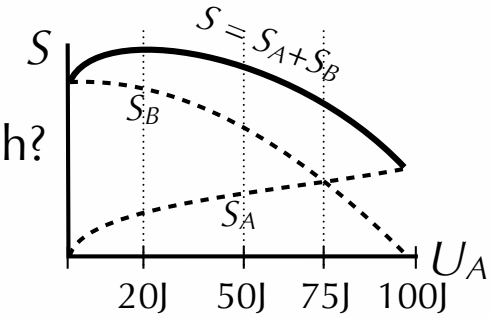
Physics 3410 Quiz 5

Please write the letter of the correct answer in the box provided. Name: _____

The graph shows the entropy in systems A and B as a function of the energy in A, where the total energy U_A+U_B of both systems is 100J. Note that A and B are not the same! Refer to this graph for 1 and 2.



☐ 1. How much energy is in A at equilibrium, according to the graph?
A) 20J B) 50J C) 75J D) 100J

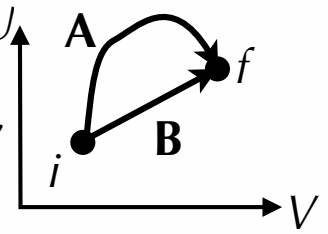
☐ 2. If $dS/dU_A < 0$, then energy will flow
A) from A into B B) from B into A C) neither of these

☐ 3. As heat flows from a hot object to a cold object, which object gains entropy?
A) the hot object B) the cold object C) both (i.e. S_{hot} and S_{cold} both increase)

☐ 4. A system of N particles has $\Omega=V^N U^{7N/2}$ microstates, and obeys the equipartition theorem. How many degrees of freedom per particle does it have?
A) 1 B) 2 C) 3 D) 3.5 E) 7

☐ 5. $\partial S/\partial V =$
A) P B) 1/P C) 1/T D) P/T

☐ 6. The graph shows how the energy and volume of two systems, A and B, change over 5 seconds. Which system gains more entropy in this time?
A) A B) B C) Both gain the same entropy



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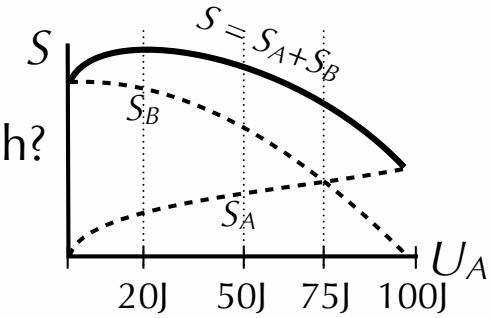


A

1. How much energy is in A at equilibrium, according to the graph?
A) 20J B) 50J C) 75J D) 100J

A

2. If $dS/dU_A < 0$, then energy will flow
A) from A into B B) from B into A C) neither of these

B

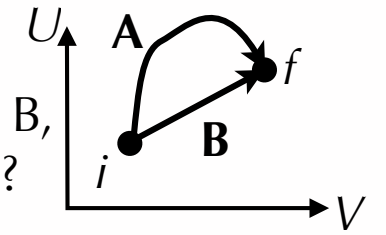
3. As heat flows from a hot object to a cold object, which object gains entropy?
A) the hot object B) the cold object C) both (i.e. S_{hot} and S_{cold} both increase)

E

4. A system of N particles has $\Omega=V^N U^{7N/2}$ microstates, and obeys the equipartition theorem. How many degrees of freedom per particle does it have?
A) 1 B) 2 C) 3 D) 3.5 E) 7

D

5. $\partial S/\partial V =$
A) P B) 1/P C) 1/T D) P/T



C

6. The graph shows how the energy and volume of two systems, A and B, change over 5 seconds. Which system gains more entropy in this time?
A) A B) B C) Both gain the same entropy