Phy 410
Quiz #2, Jan 29, 2010

Two systems $\mathcal{S}_1$ (N_1=100, U_1=100) and $\mathcal{S}_2$ (N_2=200, U_2=20) are not in thermal contact initially. The number of microstates accessible to $\mathcal{S}_1$ is g_1 and to $\mathcal{S}_2$ is g_2.

a) What is the number of microstates accessible to the combined system $\mathcal{S}_2$+$\mathcal{S}_1$ g? (2 points)

$$g = g_1 \bullet g_2$$

b) The two systems are brought into thermal contact (energy exchange) and they come to thermal equilibrium. (3 points)
Which of the following statements is true?

i) g will decrease
ii) g will remain constant
iii) g will increase

(iii) entropy increases when the two systems come to equilibrium at same τ

c) What are the energies of the two systems when they are in thermal equilibrium? (5 points)

$U_1+U_2=120$; $U_1/N_1=U_2/N_2$; $U_1=40$; $U_2=80$;