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HW #3

Physics 406

(due 02/18/13)

Reading: Omar Ch. 3

Problems:

①-3. Omar Q. 3, 4, 13

④. Omar Pr. 4

⑤. Omar Pr. 5

⑥. Omar Pr. 6

⑦. Omar Pr. 8

⑧. Please describe how Einstein used quantum theory to explain the low-temperature behavior of the specific heat in solids. Use  $\geq 4$  sentences in your response.

⑨. What is the specific heat (per unit volume) of vacuum at room temperature  $T$ ? Assume that vacuum contains black-body radiation at room  $T$  in thermal equilibrium. Use the dispersion relation for photons & keep in mind that there is no upper limit on the number of photons.