Release Date: Thursday, November 5
Due Date: Friday, November 13, 5 pm CST

Instructions: You may utilize notes, books, and problem set solutions (both your solutions and the posted solutions). You may not, however, discuss the problems with others. You may upload your solutions in any reasonable, readable format. If you have access to a printer, it may be simplest for you to print the exam, complete it on paper, then photograph/scan your answers. Please contact me if you have any questions.

Problem 1:	/	12
Problem 2:	/	8
Problem 3:	/	8
Problem 4:	/	10
Problem 5:	/	32
Problem 6:	/	30
Total:	/	100

Equations you may find useful:

$$1 = \int_{-\infty}^{\infty} dx \, \frac{1}{\sqrt{2\pi\sigma^2}} \exp\left(-\frac{(x-\mu)^2}{2\sigma^2}\right)$$

$$\sigma^2 = \int_{-\infty}^{\infty} dx \, \frac{(x-\mu)^2}{\sqrt{2\pi\sigma^2}} \exp\left(-\frac{(x-\mu)^2}{2\sigma^2}\right)$$

$$S = k_{\mathrm{B}} \ln \Omega$$

$$\beta = \frac{1}{k_{\mathrm{B}} T} = \frac{1}{k_{\mathrm{B}}} \left(\frac{\partial S}{\partial E}\right)_{N,V}$$

$$Q(\beta) = \sum_{\nu} e^{-\beta E(\nu)} \quad \text{[Canonical]}$$

$${}_M C_N = \frac{M!}{N!(M-N)!}$$

$$\mu = \int_{-\infty}^{\infty} dx \, \frac{x}{\sqrt{2\pi\sigma^2}} \exp\left(-\frac{(x-\mu)^2}{2\sigma^2}\right)$$

$$P(\nu) = \frac{e^{-\beta E(\nu)}}{Q(\beta)} \quad \text{[Canonical]}$$

$$-\beta A = \ln Q \quad \text{[Canonical]}$$

$$C_V = \left(\frac{\partial \langle E \rangle}{\partial T}\right)_{N,V}$$

$$\ln n! \approx n \ln n - n$$

This course has ended, so the exams and solutions have been removed. If you have a good reason to want access, please email Todd.