UP201: Introductory Physics III

IISc Bangalore

Semester I, 2017–2018

PROBLEM SET 2, FINISH BY: SEPT. 8, 2017

Reading: SJ, Chapters 22 and 21.

2/1. **(C) Conceptual ideas:**

(a) SJ-22-Q3[5]
(b) SJ-22-Q7[3]
(c) SJ-22-Q10[12]
(d) SJ-22-Q14[16]
(e) SJ-21-Q1[1]
(f) SJ-21-Q3[3]
(g) SJ-21-Q7[5]
(h) SJ-21-Q11[13]

2/2. **(C/T) Problems:**

(a) SJ-22-P3[1]
(b) SJ-22-P7[7]
(c) SJ-22-P10[10]
(d) SJ-22-P12[17]
(e) SJ-22-P19[21]
(f) SJ-22-P28[32]
(g) SJ-22-P36[40] What if both parts had H_2? Are you surprised?[1]
(h) SJ-22-P45[49]
(i) SJ-22-P55[59]
(j) SJ-21-P7[9]
(k) SJ-21-P12[14]
(l) SJ-21-P15[17]
(m) SJ-21-P17[21]
(n) SJ-21-P26[26]
(o) SJ-21-P34[38]
(p) SJ-21-P46[52]

[1] If you are not surprised, you should seek help.

2/3. **(C) Kelvin vs. Clausius:** Show that the Clausius statement is equivalent to the Kelvin(-Planck) statement of the second law.

2/4. **(C/T) Clausius inequality:** Using either the Kelvin-Planck statement or the Clausius statement, show that

$$\oint \frac{dQ}{T} \leqslant 0$$

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