

ECE 1502 — Information Theory  
**Problem Set 4**  
November 13, 2007

1. C&T 7.9 (Suboptimal codes)
2. C&T 7.14 (Channels with dependence between the letters)
3. C&T 7.19 (Capacity of the carrier pigeon channel)
4. C&T 7.27 (Erasure channel)
5. C&T 7.35 (Capacity) [Hint: use the result of 7.28]
6. C&T 8.1 (Differential entropy)
7. C&T 8.7 (Differential entropy bound on discrete entropy)
8. C&T 8.8 (Channel with uniformly distributed noise)
9. C&T 8.10 (Shape of the typical set)
10. C&T 9.4 (Exponential noise channels) [Assume  $X_i \geq 0$  for all  $i$ .]