

# ECE 231A HW 1

Lawrence Liu

September 26, 2022

## Problem 6

(a)

$$\begin{aligned} H(x) &= - \sum p(x) \log(p(x)) \\ &= p(A) \log(p(A)) + p(B) \log(p(B)) + p(C) \log(p(C)) \\ &\quad + p(D) \log(p(D)) + p(E) \log(p(E)) + p(F) \log(p(F)) \\ &= \frac{1}{2} \log(4) + \frac{1}{4} \log(8) + \frac{3}{16} \log\left(\frac{16}{3}\right) + \frac{1}{16} \log(16) \\ &= \boxed{2.2452 \text{ shannons}} \end{aligned}$$