1. Your recently concluded quiz has marks categorized into five grades as shown below. Calculate the entropy of this distribution.

![Bar chart showing marks distribution](image)

2. A die with six faces is rolled large number of times. Find the probability distribution that maximizes entropy when the average score becomes (a) 3.0 (b) 3.5 and (c) 4.0

3. Determine the probability distribution $p_i$ that maximizes the entropy for die rolls subject to a constant value of the second moment $\langle i^2 \rangle$. Use $\epsilon_i = i$.

4. A coin can flip to a head or a tail with probabilities $p_H$ and $p_T$. For an experiment with four coin flips, determine $(p_H, p_T)$ which gives maximum multiplicity. Is the distribution flat or biased?