Durrett Chapter 7 #1.3, 2.1, 2.3, 2.4, 3.2, 3.3, 3.7

HINTS:

(1.3) Calculate the variance of \( \sum_{m \leq 2^n} \Delta^2_{m,n} - t = \sum_{m \leq 2^n} \left( \Delta^2_{m,n} - \frac{t}{2^n} \right) \), and see what Chebychev’s Inequality tells you.

(2.3) Consider Theorem 2.6 and the analogous statement about \( B_t < 0 \).

(2.4)(ii) For a given \( M < \infty \), what happens to \( P \left( \frac{B(t)}{\sqrt{t}} > M \right) \) as \( t \to 0 \)?