1. Exercise 35 on page 29 in Durrett.

2. Exercise 38 on page 29 in Durrett.

3. Exercise 43 on page 29 in Durrett.

4. Exercise 48 on page 30 in Durrett.

5. Problem 33 on page 74 in Durrett.

6. Problem 38 on page 75 in Durrett.

7. Problem 43 on page 75 in Durrett.

8. Suppose $N$ is a Poisson($\lambda$) random variable. Show that

$$\mathbb{P}(N \text{ is even}) = \frac{1}{2}(1 + e^{-2\lambda}).$$

[Hint: it will be useful to consider the Taylor series for the function $e^\lambda + e^{-\lambda}$.]