1. Chapter 5, Problem 5.1-1.

2. Chapter 5, Problem 5.1-2.

3. Chapter 5, Problem 5.1-3.

4. Chapter 5, Problem 5.1-4.

   Hint for Part (a): We want to find the impulse response of the system shown in Fig. P5.1-4. Suppose the impulse $\delta(t)$ is given at the input. This signal goes through two paths: (i) it goes through the delay-by-T element, which gives $\delta(t-T)$, and (ii) it goes through the path at the bottom, which leaves it unchanged. Therefore, the signals entering the summer Σ are $\delta(t-T)$ and $\delta(t)$, and the signal exiting the summer is $\delta(t)-\delta(t-T)$. Furthermore, $\int_{-\infty}^{t}\big(\delta(\tau)-\delta(\tau-T)\big)\,d\tau = u(t)-u(t-T)$. Hence the output (i.e., the impulse response $h(t)$) of the entire system is $u(t)-u(t-T)$. In summary

$$h(t) \;=\; \int_{-\infty}^{t}\big(\delta(\tau)-\delta(\tau-T)\big)\,d\tau \;=\; u(t)-u(t-T) \;=\; \mathrm{rect}\big(\frac{t-\frac{T}{2}}{T}\big).$$

5. Chapter 5, Problem 5.1-5, Parts (a), (b), (c).

   Note: By "transfer function" in Part (b) your book is referring to $H(\omega)$.

6. Chapter 5, Problem 5.1-6.