University of Toronto, Department of Electrical and Computer Engineering
ECE 1724-F1 — Performant Software Systems with Rust

Quiz 5 — Sample Quiz 2 — Answer Key

Wednesday, November 25, 2026

1. Ⓒ **The shared lifetime can be the shorter valid scope.**

Both inputs and the selected slice remain valid at println inside the inner block. The annotation relates the references; it does not require their owners to have identical creation and drop times. (Book 10.3.)

2. Ⓓ **A borrowed field is valid while its owner remains alive.**

Entry stores a slice into line. line outlives the use of entry, so the borrow is valid. Trimming produces green but leaves the original eight-byte String unchanged. (Book 10.3.)

3. Ⓐ **One closure has one inferred parameter type.**

The first call determines that this closure accepts and returns String. It is not a generic function accepting any type; the later u32 argument is a type mismatch. (Book 13.1.)

4. Ⓑ **Filtering happens before mapping.**

filter keeps 4 and 6 because they exceed the captured limit 3. map doubles those values, and collect consumes the pipeline to produce the new vector [8, 12]. (Book 13.2.)

5. Ⓓ **A boxed recursive link can be dereferenced and matched.**

The outer item supplies 3. Its box contains the next item, whose value is 5. Dereferencing rest exposes that next List value to the inner match, producing 3 + 5. The box gives the recursive link a known size. (Book 15.1.)

Sources and adaptations: Original teaching variations based on the Rust standard library public documentation and the assigned book sections. No internal implementation details are tested.
Q1 source: Original teaching variation of the Book lifetime-relationship example; len is a standard string operation.
Q2 source: Original borrowed-record example built around str::trim.
Q3 source: Original variation of the Book closure type-inference example.
Q4 source: Original pipeline using standard Iterator::filter, map, and collect.
Q5 source: Teaching variation of the boxed module recursive-list example, with two concrete integer items.

Reading: *The Rust Programming Language*, 10.3: Lifetimes, 13.1: Closures, 13.2: Iterators, and 15.1: Box.