Teacher Answer Key

Case Study

1. Dr. Rivera is concerned because the stratigraphic sequence shows the bone should be older than the charcoal, but the radiocarbon date says the opposite. Possible explanations include bioturbation (animals burrowing newer material into older layers) or contamination of the bone sample during or after burial.

2. Dr. Rivera should send new samples to an independent lab for radiocarbon retesting to rule out contamination. She should also examine the stratigraphy more closely for signs of bioturbation or other disturbance before trusting either date.

Multiple Choice

1. D

2. B

3. C

Matching

1-D, 2-A, 3-E, 4-B, 5-C

Fill-in-the-Blank

1) radiocarbon, 2) stratigraphy, 3) Ranging

Short Answer (Sample Responses)

Q1: Using both methods together provides cross-checking that increases confidence in the timeline. For example, stratigraphy gives the relative order of layers while radiocarbon dating pins specific layers to calendar years, and when both agree, the timeline is reliable.

Q2: Remote sensing technologies allow archaeologists to map buried features before excavating, which saves time and money while reducing destruction of fragile sites. LiDAR can see through jungle canopy and GPR can detect buried structures, letting researchers target their excavations more precisely than traditional walking surveys.

Q3: Without dating, archaeologists would know what they found but not when it existed or how it connects to other events. Dating methods provide the timeline that turns isolated objects into a meaningful story of human history, which is what separates scientific archaeology from simply collecting old things.