Teacher Answer Key

Case Study

1. Chuck is full of collagen, the connective tissue that makes it tough, and collagen breaks down and converts into gelatin only when held in liquid at moderate heat for a long time. The fast roast reached its finish temperature before any of that conversion could happen, so the collagen stayed intact and chewy.

2. The sear is the only stage of a braise hot enough and dry enough for the Maillard reaction, which needs a dry surface above about 300 degrees. Once liquid is added the temperature is capped near boiling, so no browning can occur, and the sear supplies flavor that then spreads through the liquid.

Multiple Choice

1. D

2. A

3. C

Matching

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

Fill-in-the-Blank

1) Maillard, 2) gelatin, 3) poach

Short Answer (Sample Responses)

Q1: Roasting is dry heat, so the surface dries out and rises past 300 degrees, where the Maillard reaction browns proteins and sugars into deep savory flavor. Boiling surrounds the bird with water that cannot exceed 212 degrees, so no browning is chemically possible no matter how long it cooks.

Q2: Braising exists to convert collagen into gelatin, and tenderloin is a lightly used muscle with very little collagen to convert. With nothing to gain from the long cook, the extended heat only drives moisture out of an already tender cut and leaves it dry and stringy.

Q3: Once liquid enters the pot the temperature is capped near boiling, which is far below the roughly 300 degrees browning requires, so the dish loses its only chance to brown. The sear happens while the surface is still dry and hot, and that Maillard flavor then dissolves into the liquid.