Teacher Answer Key

Case Study

1. Water from melting snow flowed into small cracks, then froze and expanded repeatedly; blocked drains and plow piles caused water to pool in certain spots, increasing how often those cracks filled and froze, leading to potholes.

2. Snow plowed into big piles concentrated meltwater near the lot edges; blocked drains kept water from escaping, so it damaged asphalt and carried salty, gritty runoff into the creek, making the water cloudy after melts.

Multiple Choice

1. C

2. B

3. A

Matching

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

Fill-in-the-Blank

1) runoff, 2) weathering, 3) jam

Short Answer (Sample Responses)

Q1: Water seeps into a small crack, freezes, and expands, widening it. Repeated freeze–thaw cycles let more water in each time. Eventually pieces of asphalt loosen, and traffic breaks them out, creating a pothole.

Q2: Examples: sudden warm spell on top of deep snow or frozen ground causes rapid melt; rain-on-snow event leads to fast runoff into streams; frozen soils and blocked drains cause street or basement flooding even in light rain.

Q3: Moving snow piles away from drains, clearing debris and ice from grates, and designing better drainage paths keep meltwater from pooling in cracks and reduce the amount of salty, sediment-laden runoff that reaches nearby streams.