Lesson 11 Test Bank – Glaciers

Multiple Choice Questions

1. What is a glacier?
   1. A stationary mass of snow and ice
   2. A lake formed from snowmelt
   3. A large, persistent body of ice that moves under its own weight
   4. An area of permafrost that holds water

Correct Answer: C

1. Glaciers currently cover approximately what percentage of Earth's land surface?
   1. 20%
   2. 10%
   3. 5%
   4. 30%

Correct Answer: B

1. Where is most of Earth’s glacial freshwater stored today?
   1. In North America
   2. In ice caps
   3. In Antarctica and Greenland
   4. In alpine glaciers

Correct Answer: C

1. What percentage of Earth’s freshwater is held in glaciers?
   1. About 30%
   2. About 69%
   3. About 15%
   4. Less than 10%

Correct Answer: B

1. Which period saw significant glacier growth from 1350–1850 A.D.?
   1. The Tioga Glaciation
   2. The Recess Peak Period
   3. The Little Ice Age
   4. The Sherwin Period

Correct Answer: C

1. The largest volume of glacial ice is found in:
   1. Greenland
   2. Canadian Arctic
   3. Antarctica
   4. Iceland

Correct Answer: C

1. What best describes alpine glaciers?
   1. Large, flat ice sheets covering entire continents
   2. Glaciers forming at high altitudes in mountainous regions
   3. Floating slabs of sea ice
   4. Dome-shaped glacial masses over bedrock

Correct Answer: B

1. A bowl-shaped glacier that forms in mountain basins is called a:
   1. Cirque glacier
   2. Piedmont glacier
   3. Ice cap
   4. Ice dome

Correct Answer: A

1. A glacier that flows into a valley and spreads into lowlands is a:
   1. Valley glacier
   2. Cirque glacier
   3. Piedmont glacier
   4. Ice shelf

Correct Answer: C

1. Which type of glacier spreads from a central ice mass and submerges topography?
   1. Valley glacier
   2. Continental glacier
   3. Piedmont glacier
   4. Ice dome

Correct Answer: B

1. What is the largest ice mass on Earth?
   1. Greenland Ice Sheet
   2. Iceland Ice Cap
   3. Antarctic Ice Sheet
   4. Canadian Shield Glacier

Correct Answer: C

1. Which type of glacier is not constrained by topography and is less than 50,000 km²?
   1. Ice dome
   2. Outlet glacier
   3. Ice cap
   4. Ice shelf

Correct Answer: C

1. What defines an ice shelf?
   1. A glacier in a mountain basin
   2. A thick river of ice
   3. A floating slab of ice anchored to land
   4. A small glacier on permafrost

Correct Answer: C

1. What is a key feature of outlet glaciers?
   1. They are confined to polar coasts
   2. They flow through mountainous terrain
   3. They drain ice from sheets or caps
   4. They do not move

Correct Answer: C

1. What happens when accumulation exceeds ablation?
   1. The glacier retreats
   2. The glacier evaporates
   3. The glacier remains stable
   4. The glacier advances

Correct Answer: D

1. What is the boundary between accumulation and ablation zones called?
   1. Ice line
   2. Firn line
   3. Glacier shelf
   4. Equator

Correct Answer: B

1. What color does glacial ice appear when it contains air bubbles?
   1. Blue
   2. Clear
   3. White
   4. Green

Correct Answer: C

1. Which glacial zone loses more ice than it gains?
   1. Accumulation zone
   2. Ablation zone
   3. Firn zone
   4. Ice dome

Correct Answer: B

1. In alpine glaciers, what drives most of the ice flow?
   1. Meltwater erosion
   2. Gravitational flow due to slope
   3. Air pressure
   4. Tidal forces

Correct Answer: B

1. In continental glaciers, where does the ice flow begin?
   1. From the outer margins
   2. From low-altitude regions
   3. From the thickest central area
   4. At the ablation zone

Correct Answer: C

1. What are the initial snow crystals transformed into before becoming solid glacial ice?
   1. Pebbles
   2. Ice sheets
   3. Firn
   4. Permafrost

Correct Answer: C

1. Which glacial landform results from glacial scouring in mountain valleys?
   1. Cirque
   2. Arête
   3. U-shaped valley
   4. Drumlin

Correct Answer: C

1. What erosional landform is associated with cirques and sharp ridges between valleys?
   1. Drumlin
   2. Arête
   3. Esker
   4. Moraine

Correct Answer: B

1. What depositional landform is formed from unsorted glacial till?
   1. U-shaped valley
   2. Horn
   3. Moraine
   4. Arête

Correct Answer: C

1. What depositional feature is formed by meltwater streams beneath a glacier?
   1. Moraine
   2. Esker
   3. Drumlin
   4. Cirque

Correct Answer: B

1. Which landform is formed by glacial erosion followed by deposition and has a teardrop shape?
   1. Esker
   2. Drumlin
   3. Arête
   4. Horn

Correct Answer: B

1. What do glaciers create when they carve a steep basin that later fills with water?
   1. Fjord
   2. Paternoster lake
   3. Tarn
   4. Kettle lake

Correct Answer: C

1. What is the primary process that drives glacial erosion?
   1. Freezing and thawing
   2. Sliding of ice over bedrock with embedded rock fragments
   3. Water runoff
   4. Wind scouring

Correct Answer: B

1. What valley-shaping glacier helped form Yosemite National Park?
   1. Tuolumne Glacier
   2. Vatnajökull Glacier
   3. Columbia Glacier
   4. Bering Glacier

Correct Answer: A

1. Which large glacier in Alaska is covered with rock debris and contributes sediment to Vitus Lake?
   1. Hubbard Glacier
   2. Matanuska Glacier
   3. Bering Glacier
   4. Juneau Glacier

Correct Answer: C

1. What material is most glacial sediment composed of?
   1. Cemented rock
   2. Organic matter
   3. Unconsolidated debris
   4. Crystalline minerals

Correct Answer: C

1. Which glacial deposit type is often associated with subglacial transport?
   1. Ice shelf calving
   2. Moraine deposition
   3. Muddy meltwater
   4. Iceberg sediment drop

Correct Answer: D

1. What is permafrost?
   1. A type of glacier
   2. A permanently frozen layer of soil
   3. Meltwater sediment
   4. Refrozen sea ice

Correct Answer: B

1. What is a major consequence of thawing permafrost?
   1. Creation of new glaciers
   2. Slower erosion
   3. Infrastructure damage and increased carbon emissions
   4. Decrease in freshwater runoff

Correct Answer: C

1. Which U.S. region has experienced major permafrost thaw and land subsidence?
   1. Northern Rockies
   2. North Slope of Alaska
   3. Appalachian Plateau
   4. Sierra Nevada

Correct Answer: B

1. Which feature is found in the zone of accumulation?
   * 1. A cirque
     2. A terminal moraine
     3. An outwash plain
     4. None of the above

Correct Answer: A

1. Which of the following features are found on the side of an alpine glacier?
   * 1. A lateral moraine
     2. A terminal moraine
     3. A medial moraine
     4. None of the above

Correct Answer: A

Written Response Questions

1. Define a glacier.

Correct Answer: A glacier is a large, long-lasting mass of ice that forms on land and moves under its own weight.

1. Differentiate between alpine glaciers and continental glaciers.

Correct Answer: Alpine glaciers form in mountainous regions and flow through valleys, while continental glaciers are massive ice sheets that cover large land areas and are not confined by topography.

1. Briefly describe the conditions under which glaciers form.

Correct Answer: Glaciation occurs where the winter-time accumulation of snow exceeds the summer loss. Through time, snow accumulates to a sufficient depth to metamorphose into ice. Conditions for glaciation usually occur at high latitudes or high altitudes where temperatures are cool enough to inhibit melting.

1. Under what conditions will a glacier advance or retreat?

Correct Answer: If the mass balance is positive the glacier will advance. If the mass balance is negative it will retreat.

1. What is the firn line and how does it indicate a glacier's health?

Correct Answer: The firn line is the boundary between the accumulation and ablation zones. A rising firn line suggests more melting than accumulation, indicating a retreating glacier.

1. How do glaciers erode the surface?

Correct Answer: Crushing, plucking and abrasion.

1. Compare the flow mechanisms of alpine and continental glaciers.

Correct Answer: Alpine glaciers flow primarily due to gravity down slope, whereas continental glaciers flow outward from the thick central accumulation zone under pressure.

1. What causes a U-shaped valley to form, and how is it different from a river valley?

Correct Answer: U-shaped valleys are formed by glacier erosion that widens and deepens the valley. River valleys are typically V-shaped due to water cutting down through rock.

1. Explain how cirques and tarns form.

Correct Answer: Cirques are bowl-shaped depressions scoured into the side of a mountain by an alpine glacier. Tarns are small depressions filled with water on the cirque floor.

1. What are the environmental consequences of glacial retreat?

Correct Answer: Glacial retreat contributes to sea level rise, loss of freshwater sources, and altered hydrology. It can also lead to glacial lake outburst floods and habitat changes.

1. Describe permafrost and its significance in the context of climate change.

Correct Answer: Permafrost is permanently frozen ground. Thawing releases greenhouse gases like methane and CO₂, damages infrastructure, and alters ecosystems.

