Climate Change Impacts on Earth's Biosphere

Climate Change · Practice Test · 10 Questions

1. What is the primary mechanism by which ocean acidification, caused by increased atmospheric CO2, affects calcifying organisms like pteropods?

A) Increased water temperature kills the organisms
B) Increased hydrogen ion concentration reduces carbonate ion availability
C) Decreased salinity inhibits shell formation
D) Enhanced photosynthesis causes toxic algal blooms

2. Which phenomenon is identified as the primary driver of 'phenological mismatch' in migratory bird species due to climate change?

A) Shifts in magnetic pole orientation
B) Changes in the timing of peak insect abundance
C) Increased predation by invasive species
D) Reduced availability of nesting materials

3. In the context of coral bleaching, which biological process is disrupted between the coral polyp and its symbiotic zooxanthellae?

A) The synthesis of calcium carbonate
B) The process of photosynthesis providing glucose to the host
C) The nitrogen fixation process in the coral gut
D) The mechanical filtration of zooplankton

4. Which specific Arctic marine mammal is listed as a 'vulnerable' species under the IUCN Red List primarily due to sea ice loss impacting its foraging and mating habitats?

A) Pusa hispida (Ringed seal)
B) Ursus maritimus (Polar bear)
C) Monodon monoceros (Narwhal)
D) Odobenus rosmarus (Walrus)

5. The 'treeline shift' observed in high-latitude mountain ecosystems is a documented response to rising temperatures. Which factor most limits this upward migration?

A) Increased atmospheric pressure
B) Soil nutrient availability and depth
C) Decreased solar radiation
D) The presence of predatory insects

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6. Which chemical feedback loop is currently accelerating permafrost degradation in the Siberian tundra?

A) Nitrogen sequestration by mosses
B) Release of sequestered methane and carbon dioxide
C) Increased absorption of solar radiation by volcanic ash
D) Decreased transpiration from coniferous trees

7. What is the main physiological impact of warming oceans on the metabolic rate of ectothermic fish species?

A) Decreased metabolic rate leading to lethargy
B) Increased metabolic demand exceeding oxygen supply
C) Total cessation of reproductive activity
D) Enhanced growth rates regardless of oxygen availability

8. The migration of the 'huckleberry' (Vaccinium membranaceum) is restricted in alpine regions due to the disappearance of which specific environmental factor?

A) High soil humidity
B) Reliable winter snowpack for insulation
C) Extended periods of darkness
D) Specific pollinator species of moths

9. How does climate change specifically impact the sex ratio of sea turtle populations, such as Chelonia mydas?

A) By altering the salinity of nesting beaches
B) By temperature-dependent sex determination (TSD) in eggs
C) By increasing the frequency of hurricanes
D) By reducing the viability of hatchling movement

10. Which specific carbon sink in the Southern Ocean has shown decreased efficiency in absorbing anthropogenic CO2 due to intensified wind patterns?

A) The deep-sea coral reefs
B) The Southern Ocean 'biological pump' and surface mixing
C) The Antarctic ice shelf edge
D) The benthic sediment layers

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