



Practice Midterm Exam

Raven, Berg, Hassenzahl: Environment, 7th Edition
Chapter 05: Ecosystems and the Physical Environment

1. Why was Hurricane Katrina such a devastating storm?
- a) the city is at or below sea level
 - b) sea level has been rising
 - c) destruction of wetlands due to construction
 - d) the city has been subsiding
 - e) all of these

Ans: e

Difficulty: Easy

Response:

Case in Point: Hurricane Katrina; 5.5.4

2. Storm surges:
- 1) are sudden increases in water that move onto land during a cyclone
 - 2) are sudden increases in water that move onto land during a typhoon
 - 3) are sudden increases in water that move onto land during a hurricane
- a) 1
 - b) 2
 - c) 3
 - d) 1, 2 and 3
 - e) none of these

Ans: d

Difficulty: Easy

Response:

Tropical Cyclones; 5.5.3

3. Biogeochemical cycles:
- a) only include processes conducted by or within living organisms
 - b) pertain only to the abiotic environment
 - c) describe the movement of water and other materials through abiotic and biotic interactions
 - d) only pertain to exchanges and interactions that occur within the atmosphere
 - e) are used to describe the attempts of humans to recycle various pollutants

Ans: c

Difficulty: Easy

Response:

The Cycling of Materials within Ecosystems 5.1



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4. Which of the following is not one of the biogeochemical cycles considered of particular importance for organisms?
- a) carbon
 - b) hydrogen
 - c) nitrogen
 - d) phosphorus
 - e) water

Ans: b

Difficulty: Medium

Response:

The Cycling of Materials within Ecosystems; Entire Section; 5.1

5. In the carbon cycle, carbon can be found in:
- a) limestone, animals, and plants
 - b) oil, bicarbonate, and sugar
 - c) carbon dioxide and coal
 - d) the atmosphere
 - e) all of these

Ans: e

Difficulty: Easy

Response:

The Cycling of Materials within Ecosystems; The Carbon Cycle; 5.1.1

6. Approximately what percentage of the atmosphere is CO₂?
- a) 0.001%
 - b) 0.038%
 - c) 10%
 - d) 30%
 - e) 75%

Ans: b

Difficulty: Easy

Response:

The Cycling of Materials within Ecosystems; The Carbon Cycle; 5.1.1

7. The pathway by which carbon is transferred from living organisms to the atmosphere is called:
- a) photosynthesis
 - b) cellular respiration
 - c) cellular transpiration
 - d) burning fossil fuels
 - e) transpiration

Ans: b

Difficulty: Easy

Response:

The Cycling of Materials within Ecosystems; The Carbon Cycle; 5.1.1



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8. The movement of water from land to rivers, lakes, wetlands and ultimately, the ocean is called:
- a) groundwater
 - b) transpiration
 - c) hydrologic cycle
 - d) runoff
 - e) precipitation

Ans: d

Difficulty: Easy

Response:

The Cycling of Materials within Ecosystems; The Hydrologic Cycle; 5.1.5

9. Which of the following is not an example of a fossil fuel?
- a) wood
 - b) oil
 - c) natural gas
 - d) coal
 - e) the remains of ancient organisms

Ans: a

Difficulty: Easy

Response:

The Cycling of Materials within Ecosystems; The Carbon Cycle; 5.1.1

10. Which of the following is not a source of carbon for the carbon cycle?
- a) shells of marine organisms
 - b) oil
 - c) decomposers
 - d) inorganic fertilizer
 - e) the atmosphere

Ans: d

Difficulty: Easy

Response:

The Cycling of Materials within Ecosystems; The Carbon Cycle; 5.1.1

11. The nitrogen cycle is one of the most important and complex of the biogeochemical cycles. It is important because nitrogen:
- a) is a greenhouse gas
 - b) is an essential part of biological molecules such as proteins and nucleic acids (DNA)
 - c) is the most toxic element to living organisms
 - d) dilutes the oxygen in the atmosphere causing respiratory problems
 - e) is a crucial part of the process of photosynthesis

Ans: b

Difficulty: Medium

Response:

The Nitrogen Cycle; 5.1.2



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12. Nitrogen fixation is:

- a) the conversion of gaseous nitrogen into an organism friendly form (ammonia (NH₃))
- b) preplanned setting of atmospheric levels of nitrogen at 78%
- c) stabilizing elemental nitrogen into a gaseous two-atom molecule (N₂)
- d) the reduction of nitrate (NO₃⁻) to gaseous nitrogen
- e) the repair of DNA by adding nitrogen to the organism's diet

Ans: a

Difficulty: Easy

Response:

The Nitrogen Cycle; 5.1.2

13. Nitrogen is essential for living organisms to synthesize:

- a) lipids
- b) proteins
- c) carbohydrates
- d) sulfates
- e) benzene rings

Ans: b

Difficulty: Easy

Response:

The Cycling of Materials within Ecosystems; The Nitrogen Cycle; 5.1.2

14. Nitrogen gas accounts for what percentage of the atmosphere?

- a) 0.03%
- b) 1%
- c) approximately 50%
- d) 78%
- e) 99%

Ans: d

Difficulty: Easy

Response:

The Cycling of Materials within Ecosystems; The Nitrogen Cycle; 5.1.2

15. What is the first step in the nitrogen cycle, in which gaseous nitrogen is converted into ammonia?

- a) nitrification
- b) ammonification
- c) assimilation
- d) denitrification
- e) nitrogen fixation

Ans: e

Difficulty: Easy

Response:

The Cycling of Materials within Ecosystems; The Nitrogen Cycle; 5.1.2



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16. Which of the following plants is a legume which may have nitrogen fixing bacteria attached to its roots?
- a) bean
 - b) beet
 - c) potato
 - d) cucumber
 - e) carrot

Ans: a

Difficulty: Easy

Response:

The Cycling of Materials within Ecosystems; The Nitrogen Cycle; 5.1.2

17. What part of the nitrogen cycle deals with the conversion of nitrogen in waste products (urea in urine) into ammonia?
- a) nitrification
 - b) ammonification
 - c) assimilation
 - d) denitrification
 - e) nitrogen fixation

Ans: b

Difficulty: Easy

Response:

The Cycling of Materials within Ecosystems; The Nitrogen Cycle; 5.1.2

18. The reduction of nitrate (NO_3^-) to gaseous nitrogen (N_2) is called:
- a) nitrification
 - b) ammonification
 - c) assimilation
 - d) denitrification
 - e) nitrogen fixation

Ans: d

Difficulty: Easy

Response:

The Cycling of Materials within Ecosystems; The Nitrogen Cycle; 5.1.2

19. By what process do plants take the nitrate (NO_3^-) absorbed by their roots and incorporate the nitrogen into plant proteins and other molecules?
- a) nitrification
 - b) ammonification
 - c) assimilation
 - d) denitrification
 - e) nitrogen fixation

Ans: c

Difficulty: Easy

Response:

The Cycling of Materials within Ecosystems; The Nitrogen Cycle; 5.1.2



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20. Nitrogen fertilizer:

- a) contributes to acid rain
- b) leads to the formation of dioxins
- c) may contaminate groundwater
- d) contributes to the production of photochemical smog
- e) all of these

Ans: c

Difficulty: Easy

Response:

The Cycling of Materials within Ecosystems; The Nitrogen Cycle; 5.1.2

21. One human impact on the phosphorus cycle occurs through:

- a) burning of fossil fuels
- b) the erosion of agricultural lands
- c) the greenhouse effect
- d) global warming
- e) depletion of the ozone layer

Ans: b

Difficulty: Medium

Response:

The Cycling of Materials within Ecosystems; The Phosphorus Cycle; 5.1.3

22. Which of the following processes plays an important role in the phosphorus cycle?

- a) erosion
- b) fixation
- c) combustion
- d) cellular respiration
- e) ammonification

Ans: a

Difficulty: Easy

Response:

The Cycling of Materials within Ecosystems; The Phosphorus Cycle; 5.1.3

23. Transpiration occurs in:

- a) oceans
- b) groundwater
- c) the atmosphere
- d) animals
- e) terrestrial plants

Ans: e

Difficulty: Medium

Response:

The Cycling of Materials within Ecosystems; The Hydrologic Cycle; 5.1.5



Practice Midterm Exam

24. Solar radiation:

- a) powers the hydrologic and other biogeochemical cycles
- b) is essential for photosynthesis
- c) is the product of a massive nuclear fusion reaction
- d) is captured by plants and may eventually become the energy available from fossil fuels
- e) all of these

Ans: e

Difficulty: Easy

Response:

The Cycling of Materials within Ecosystems; Entire Section; 5.1

25. Which of the following surfaces has the highest albedo?

- a) glaciers
- b) forests
- c) the ocean
- d) buildings
- e) pavements

Ans: a

Difficulty: Easy

Response:

Solar Radiation; 5.2

26. The primary reason we have seasons is because of the:

- a) the Earth's rotation
- b) the Earth's orbit
- c) the Earth's tilt on its axis
- d) the density of the Earth's atmosphere
- e) the layers of the Earth's atmosphere

Ans: c

Difficulty: Easy

Response:

Temperature Changes with the Seasons; 5.2.2

27. The Earth's atmosphere is important because:

- a) it is primarily composed of oxygen, essential for our survival
- b) it is composed of approximately twenty different layers
- c) it protects us from UV radiation and X-rays
- d) it is a stable and unchanging part of our global environment
- e) the densest outer layer shields the Earth's surface from dangerous forms of energy

Ans: c

Difficulty: Easy

Response:

The Atmosphere; 5.3



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28. Stratospheric ozone is important because it:

- a) absorbs UV radiation
- b) is what we breathe
- c) powers the weather cycle
- d) is an industrial pollutant
- e) is a part of the troposphere

Ans: a

Difficulty: Easy

Response:

Layers of the Atmosphere; 5.3.1

29. The thermosphere:

- a) is the layer of atmosphere closest to the Earth's surface
- b) extends to a height of approximately 35 km
- c) is characterized by very low temperatures
- d) is important in long-distance communication between humans
- e) is the layer where weather, including most clouds and wind, occurs

Ans: d

Difficulty: Easy

Response:

Layers of the Atmosphere; 5.3.1

30. The ocean conveyor belt affects:

- a) the nitrogen cycle
- b) albedo
- c) the greenhouse effect
- d) regional and possibly global climate
- e) surface ocean currents

Ans: d

Difficulty: Medium

Response:

Vertical Mixing of Ocean Water; 5.4.2

31. Complex horizontal movements of the atmosphere are commonly known as:

- a) gyres
- b) wind
- c) climate
- d) the Coriolis effect
- e) upwellings

Ans: b

Difficulty: Medium

Response:

Atmospheric Circulation; 5.3.2



Practice Midterm Exam

32. Which of the following does not describe major surface winds that blow more or less continually?

- a) prevailing winds
- b) polar easterlies
- c) Westerlies
- d) trade winds
- e) Coriolis

Ans: e

Difficulty: Medium

Response:

Atmospheric Circulation; 5.3.2

33. The Coriolis effect is associated with:

- a) variations in the amount of solar radiation reaching different locations
- b) seasonal changes in the levels of solar radiation at a given location
- c) the density of the oceans
- d) the Earth's orbit
- e) the Earth's rotation

Ans: e

Difficulty: Easy

Response:

Atmospheric Circulation; 5.3.2

34. Gyres are:

- a) prevailing winds
- b) circular ocean currents
- c) an effect of El Niño
- d) an upwelling of deeper waters
- e) major climate zones

Ans: b

Difficulty: Easy

Response:

Patterns of Circulation in the Ocean; 5.4.1

35. El Niño—Southern Oscillation events:

- a) are responsible for dramatic increases in the productivity of fisheries off South America
- b) reach coastal areas of Peru around mid-summer
- c) occur once or twice every century
- d) alter both ocean and atmospheric circulation patterns
- e) have little impact on marine organisms, but devastating effects on terrestrial weather patterns

Ans: d

Difficulty: Medium

Response:

Interactions with the Atmosphere; 5.4.3



Practice Midterm Exam

36. Cyclones, hurricanes and typhoons are distinguished from one another by:

- a) size
- b) speed
- c) direction of spin
- d) location
- e) destructive potential

Ans: d

Difficulty: Easy

Response:

Tropical Cyclones; 5.5.3

37. Which of the following does not influence climate?

- a) distance from the ocean
- b) topography
- c) latitude
- d) vegetation
- e) none of these, all affect climate

Ans: e

Difficulty: Medium

Response:

Weather and Climate; Entire Section; 5.5

38. Precipitation:

- a) refers to any form of water, including rain, snow, runoff and groundwater
- b) has a profound effect on the distribution of organisms
- c) is lightest near the windward (the side from which the wind blows) coasts of continents
- d) varies among geographic locations, with the highest annual precipitation occurring in Chile
- e) occurs independently of atmospheric circulation patterns

Ans: b

Difficulty: Medium

Response:

Precipitation; 5.5.1

39. Which of the following has the most concentrated energy and highest destructive potential?

- a) tornadoes
- b) ice storms
- c) thunderstorms
- d) El Niño—Southern Oscillation
- e) tsunamis

Ans: a

Difficulty: Medium

Response:

Weather and Climate; Entire Section; 5.5



Practice Midterm Exam

40. Subduction occurs:

- a) when ozone is struck by cosmic radiation
- b) when one tectonic plate descends below another
- c) because of the Coriolis effect
- d) on the leeward side of a mountain
- e) as the result of volcanic eruptions or earthquakes

Ans: b

Difficulty: Easy

Response:

Internal Planetary Processes; 5.6

41. Volcanoes are commonly found:

- a) near canyons
- b) where land masses on two different plates come together
- c) above hot spots
- d) on land, but never beneath the ocean surface
- e) in the Southern Hemisphere and only rarely in the Northern Hemisphere

Ans: c

Difficulty: Medium

Response:

Volcanoes; 5.6.2

42. The scale typically used by seismologists to measure the magnitude of an earthquake is the:

- a) Richter scale
- b) subduction scale
- c) earthquake scale
- d) moment magnitude scale
- e) seismologist's earth movement indicator scale

Ans: d

Difficulty: Easy

Response:

Earthquakes; 5.6.1

43. Rain shadow describes the;

- a) silhouette of mountains as the sun passes from east to west
- b) shade on the ground produced by clouds that threaten rain
- c) darkened areas of the distant sky indicating rain is falling at a far-away location
- d) dry land on the side of the mountains away from the prevailing wind
- e) lessening of a chance of precipitation on any given day due to dry air at the equator

Ans: d

Difficulty: Easy

Response:

Precipitation; 5.5.1



Practice Midterm Exam

44. Which of the following does not affect ocean currents?

- a) position of the continents
- b) marine organisms
- c) atmospheric temperatures
- d) prevailing winds
- e) varying density of seawater

Ans: b

Difficulty: Medium

Response:

Patterns of Circulation in the Ocean; Vertical Mixing of Ocean Water; 5.4.1 and 5.4.2

45. A tropical cyclone forms as:

- a) a mass of cool, dry air collides with warm humid air
- b) a sudden increase in water moves onto land
- c) wind picks up speed as it moves from land to water
- d) strong winds pick up moisture over warm waters
- e) all of these

Ans: d

Difficulty: Medium

Response:

Tropical Cyclones; 5.5.3

46. Which of the following statements about the sulfur cycle is true?

- a) Bacteria play little or no role in the sulfur cycle.
- b) Most of the planet's sulfur is found in the atmosphere.
- c) Plants are unable to assimilate sulfate (SO_4^{2-}).
- d) Sea spray, forest fires, and dust storms release sulfates (SO_4^{2-}) into the air.
- e) Sedimentary rocks and erosion do not contribute to the sulfur cycle.

Ans: d

Difficulty: Medium

Response:

The Sulfur Cycle; 5.1.4

47. During photosynthesis, plants, algae, and certain bacteria remove CO_2 from the air and fix it into chemical compounds such as _____.

- a) water
- b) sugar
- c) salt
- d) acids
- e) ammonia

Ans: b

Difficulty: Medium

Response:

The Carbon Cycle; 5.1.1



Practice Midterm Exam

48. Steps I and VII come together to complete the carbon-silicate cycle. However, two consecutive steps of this cycle are OUT OF ORDER – which two?

- I. In weathering, atmospheric CO_2 dissolves in rainwater to form carbonic acid (H_2CO_3)
 - II. Carbonic acid dissociates to form hydrogen ions (H^+) as rainwater moves through soil
 - III. Hydrogen ions enter silicate-rich minerals such as feldspar, releasing calcium ions (Ca^{2+})
 - IV. Microscopic marine organisms incorporate (Ca^{2+} and HCO_3^-) into their shells
 - V. Calcium and bicarbonate ions wash into surface waters and eventually reach the ocean
 - VI. Shells are incorporated into sedimentary rock
 - VII. Geological uplift exposes limestone, which is eroded by weathering returning CO_2 to the atmosphere and water.
- a) II and III
 - b) III and IV
 - c) IV and V
 - d) V and VI
 - e) none, all the steps are in the correct order

Ans: c

Difficulty: Medium

Response:

The Carbon Cycle; 5.1.1

49. Which of the following accurately represents a sequential portion of the nitrogen cycle?

- a) N_2 in the atmosphere, ammonification, nitrification, plants
- b) N_2 in the atmosphere, nitrification, plants
- c) dead organic material, ammonification, nitrification, plants
- d) plant proteins, animal proteins, nitrification, N_2 in the atmosphere
- e) animal proteins, nitrogen fixation, N_2 in the atmosphere

Ans: c

Difficulty: Medium

Response:

The Nitrogen Cycle; 5.1.2

50. The phosphorus cycle differs from the carbon cycle in that:

- a) there is little or no human impact on the phosphorus cycle
- b) phosphorus is not a critical component of living organisms
- c) the hydrosphere plays a role in the phosphorus cycle
- d) the atmosphere does not contribute to the phosphorus cycle
- e) plants play a role in the carbon cycle, but have no role in the phosphorus cycle

Ans: d

Difficulty: Medium

Response:

The Carbon Cycle, The Phosphorus Cycle; 5.1.1 and 5.1.3



Practice Midterm Exam

51. Which of the following processes is not involved in the hydrologic cycle?
- a) transpiration
 - b) precipitation
 - c) evaporation
 - d) fixation
 - e) condensation

Ans: d

Difficulty: Medium

Response:

The Hydrologic Cycle; 5.1.5

52. Which of the following accurately represents a carbon source and the process that releases carbon from that source?
- a) fossil fuels, respiration
 - b) animals, photosynthesis
 - c) plants, cellular respiration
 - d) bicarbonate, combustion
 - e) limestone, combustion

Ans: c

Difficulty: Medium

Response:

The Carbon Cycle; 5.1.1

53. Many plants have evolved mutualistic relationships with nitrogen-fixing bacteria because:
- a) the bacteria transform nitrogen into useful forms for the plants; the plants provides carbohydrates
 - b) the bacteria protect the plant from harmful effects of nitrogen compounds such as ammonia; the plants provide carbohydrates for the bacteria
 - c) the bacteria utilize nitrogen to produce energy for the plants; the plants provide the source of the nitrogen for the bacteria
 - d) the bacteria provide natural immunities to the plants; the plants shelter the bacteria from predators
 - e) there is not a mutualistic relationship between nitrogen-fixing bacteria and plants

Ans: a

Difficulty: Medium

Response:

The Nitrogen Cycle; 5.1.2



Practice Midterm Exam

54. Put the following surfaces in descending order from those surfaces that reflect the greatest percent of sunlight hitting their surfaces to those surfaces that have the lowest albedo.

- I. clouds
 - II. ice sheets
 - III. forest
 - IV. asphalt pavement
- a) I – II – III - IV
 - b) II – I – IV - III
 - c) III – I – IV - II
 - d) IV – III – II – I
 - e) II – IV – I – III

Ans: b

Difficulty: Medium

Response:

Solar Radiation 5.2

55. If the temperature of the troposphere decreases with increasing altitude by about 6°C for every kilometer, then the temperature at the outermost edge of this layer is approximately _____ lower than at the Earth's surface.

- a) 0°C
- b) 6°C
- c) 60°C
- d) 360°C
- e) 600°C

Ans: c

Difficulty: Medium

Response:

Layers of the Atmosphere; 5.3.1

56. Lava is to volcano as tsunami is to:

- a) tornado
- b) cyclone
- c) firestorm
- d) earthquake
- e) plate boundary

Ans: d

Difficulty: Medium

Response:

Earthquakes; Tropical Cyclones ; 5.6.1 and 5.5.3

57. Weather incorporates all of the following atmospheric conditions except:

- a) atmospheric pressure
- b) latitude
- c) cloudiness
- d) humidity
- e) wind

Ans: b

Difficulty: Medium

Response:

Weather and Climate; Entire section; 5.5



Practice Midterm Exam

58. El Niño and La Niña are similar in that both events:
- a) originate in the Atlantic Ocean
 - b) affect weather patterns
 - c) are predictable every year
 - d) cause global warming
 - e) are associated with Christmas

Ans: b

Difficulty: Medium

Response:

Ocean Interactions with the Atmosphere; 5.4.3

59. After the 2004 tsunami, the death tolls in 2 coastal Sri Lankan cities were examined. The village with intact mangrove vegetation recorded _____ deaths, whereas the other settlement had almost _____ deaths.
- a) 2; 6000
 - b) 20; 6000
 - c) 6; 2000
 - d) 60; 2000
 - e) 100; 1000

Ans: a

Difficulty: Easy

Response:

Earthquakes; 5.6.1

60. The atmosphere consists of five concentric layers. What is the order of these layers starting at the Earth's surface?
- I. Troposphere
 - II. Thermosphere
 - III. Mesosphere
 - IV. Stratosphere
 - V. exosphere
- a) I – II – III – IV – V
 - b) I – IV – III – II – V
 - c) V – II – III – I – IV
 - d) II – III – V – IV – I
 - e) V- IV – III – II – I

Ans: b

Difficulty: Medium

Response:

Layers of the Atmosphere; 5.3.1



Practice Midterm Exam

61. What is the relationship between locations of earthquakes and plate tectonics?
- a) Earthquakes frequently happen where landmasses are on the boundary between two plates.
 - b) Earthquakes release energy as seismic waves. Energy accumulates from the push and stretch of rocks as plates move horizontally across Earth's surface.
 - c) Earthquakes occur along faults. Fault zones are often found at plate boundaries.
 - d) Earthquakes are common in volcanic regions. Volcanoes are common where two plates meet.
 - e) All of these constitute a relationship between earthquakes and plate tectonics.

Ans: e

Difficulty: Medium

Response:

Earthquakes; 5.6.1

62. Weather is a term that refers to the conditions in the atmosphere on a _____ basis, whereas climate is a description of _____ weather conditions.
- a) hourly or daily; average, long-term
 - b) permanent; temporary
 - c) global; local
 - d) stable; unstable
 - e) long-term; short-term

Ans: a

Difficulty: Medium

Response:

Weather and Climate; 5.5

63. Why were the mangroves cut down in the Sri Lankan village?
- a) lumber
 - b) fossil fuel used for energy
 - c) export to boost their economy
 - d) to build tourist resorts or aquaculture
 - e) all of these

Ans: d

Difficulty: Easy

Response:

Earthquakes; 5.6.1

64. Winds tend to blow from areas of _____ atmospheric pressure to areas of _____ atmospheric pressure, and the greater the difference between the high- and low-pressure areas, the _____ the wind.
- a) low; high; weaker
 - b) high; low; stronger
 - c) low; high; stronger
 - d) high; low; weaker
 - e) east; west; more continuous

Ans: b

Difficulty: Medium

Response:

Atmospheric Circulation; 5.3.2



Practice Midterm Exam

65. Which of the following contributed to the high loss of life during the 2008 earthquake in Sichuan Province, China?
- 1) many buildings were not constructed to withstand earthquakes
 - 2) the focus of the earthquake was extremely deep in the earth's crust, affecting the earth's surface over a wider area
 - 3) Sichuan is near the boundary of two tectonic plates
 - 4) all of these
- a) 1
 - b) 2
 - c) 3
 - d) 4
 - e) Both 1 and 3

Ans: e

Difficulty: Medium

Response:

Chapter Opener; 5.0

66. What is the function of the TAO/TRITON array?
- a) to assist in the prediction of ENSO weather events
 - b) to monitor global atmospheric CO₂ concentrations
 - c) to help map location of the Gulf Stream
 - d) to monitor seismic activity on the seafloor
 - e) to measure ocean temperature variation

Ans: a

Difficulty: Easy

Response:

Ocean Interactions with the Atmosphere; 5.4.3

67. Which biogeochemical cycle(s) contribute(s) to eutrophication?
- a) the phosphorus cycle
 - b) the carbon cycle
 - c) the N cycle
 - d) both the phosphorus cycle and the N cycle
 - e) all of these

Ans: d

Difficulty: Medium

Response:

The Cycling of Materials within Ecosystems; Entire Section; 5.1