Oceanography
Chapter 7 Study Questions

1. If comparable areas of land and ocean receive equal amounts of sunlight, predict which will heat up more during the day and which will cool down more at night. Explain this behavior in terms of contrasting properties of rock and water.

2. Predict how the composition of major gases in Earth's atmosphere would likely be different today if life had never developed in the planet's oceans.

3. Describe the likely environmental consequences of: (1) decreasing the amount of ozone in Earth's upper atmosphere; and (2) increasing the amount of carbon dioxide in the planet's atmosphere. In each case, explain how changing the atmosphere's composition is connected to the environmental change.

4. Sketch a map of the planetary wind system that includes pressure belts and directions of wind bands between them. For a given band, explain why wind moves as it does with reference to pressure differences and Coriolis effect.

5. Sketch a map or cross-section and indicate wind directions and areas of precipitation associated with: (1) a monsoon; and (2) a rainshadow. In each case, describe how lateral and vertical air movements lead to areas of precipitation or aridity.

6. Explain why hurricanes gain strength while they remain over warm ocean waters and weaken when they move over land or cold waters.

7. Explain how warming of sea surface and cessation of onshore winds are "connected" during the occurrence of an El Niño.

1. Because of the variable angle at which the Sun's rays strike Earth's surface, the _____ region(s) receive the most intense solar radiation.
   A. equatorial
   B. subtropical
   C. mid-latitude
   D. high latitude
   E. polar

2. Earth's albedo, or the proportion of solar radiation it reflects back into space, is about _____ %.
   A. 5.5
   B. 35
   C. 59.5
   D. 65
   E. 94.5

3. Daily and seasonal temperature variations over oceans are _____ those over continental areas.
   A. comparable to
   B. larger than
   C. more erratic than
   D. smaller than
   E. uniformly cooler than
4. Bodies of rock warm up faster and cool off faster than bodies of water with similar masses because they _____.
   A. lack of evaporative cooling
   B. lack of convective overturn
   C. have lower specific heats
   D. are opaque
   E. all of the above

5. The presence of abundant _____ in the atmosphere is due to the formation of oceans and the development of life on Earth.
   A. argon
   B. carbon dioxide
   C. nitrogen
   D. oxygen
   E. chlorofluorocarbons

6. All of the phenomena we think of as “weather” take place in the _____, or lowest layer of the atmosphere.
   A. altosphere
   B. mesosphere
   C. stratosphere
   D. thermosphere
   E. troposphere

7. Which of the following greenhouse gases makes the largest contribution to global warming?
   A. methane, CH₄
   B. nitrous oxide, N₂O
   C. tropospheric ozone, O₃
   D. chlorofluorocarbons
   E. carbon dioxide, CO₂

8. Ozone (O₃) is beneficial in Earth’s upper atmosphere where it absorbs _____ electromagnetic radiation from the Sun.
   A. radio
   B. microwave
   C. infrared
   D. visible
   E. ultraviolet

9. The Coriolis effect causes air currents to turn to the _____ of their intended paths in the northern hemisphere.
   A. right
   B. left
   C. east
   D. west
   E. south
10. The *planetary wind system model* predicts that winds will blow from the _____ between 0 and 30°S.
   A. south  
   B. southeast  
   C. southwest  
   D. north  
   E. northeast

11. Mount Shasta receives more rainfall than the surrounding countryside because of its high elevation. This is an example of _____ precipitation.
   A. orographic  
   B. convective  
   C. cyclonic  
   D. convergent  
   E. seasonal

12. During an *El Niño* upwelling ceases in the eastern Pacific and surface waters become _____ than usual.
   A. warmer  
   B. cooler  
   C. richer in nutrients  
   D. saltier  
   E. wetter