

## **Exam 2 Review Questions**

### **Chapter 3:**

- 1) \_\_\_\_\_ is the green pigment in plants that absorbs radiant energy
- 2) Photosynthesis uses \_\_\_\_\_, water, and radiant energy to produce sugar, water, and oxygen
- 3) Cellular Respiration uses \_\_\_\_\_, oxygen, and water to produce carbon dioxide, water, and energy.
- 4) \_\_\_\_\_ converts stored chemical energy into kinetic energy
- 5) An example of an autotroph is a \_\_\_\_\_.
- 6) Producers use \_\_\_\_\_ to power photosynthesis.
- 7) An example of heterotroph is a \_\_\_\_\_.
- 8) An earthworm is an example of a \_\_\_\_\_.
- 9) A Community and its non-living physical environment make up an \_\_\_\_\_.
- 10) From where does the energy to run planet Earth come? How is this energy utilized by the producers?
- 11) Write the chemical formula for photosynthesis:
- 12) Write the chemical formula for cellular respiration:
- 13) Explain why only 10% of the energy is passed on as energy moves from one trophic level to another.
- 14) Explain the second law of thermodynamics.
- 15) Explain the differences between GPP and NPP.
- 16) What is the difference between a food chain and a food web?
- 17) The Abiotic environment includes a variety of factors including (Select all that apply)
  - A. Carnivores
  - B. Sunlight
  - C. Primary Producers
  - D. Decomposers
  - E. Consumers

18) An ecosystem can be characterized as:

- A. Populations + Community
- B. All species, population, and community interactions for organisms in a given area
- C. The abiotic components of the environment.
- D. All of the biological interactions, plus interactions between the biotic and abiotic environment.
- E. Interactions between physical processes and the abiotic environment in which organisms live.

19) Light is the energy source for which process?

- A. Respiration
- B. Photosynthesis
- C. Glycolysis
- D. Mitochondria
- E. Chemical productivity in the deep sea

20) Which of the following is NOT a product of cell respiration?

- A. Carbon dioxide
- B. Water
- C. Sugar
- D. Energy
- E. A and B

21) Which of the following is a good example of a producer?

- A. A Rabbit
- B. Algae
- C. A Fungus
- D. A Saprotroph

22) A Wolf is an example of:

- A. A Heterotroph
- B. An Autotroph
- C. A Saprotroph
- D. An Herbivore
- E. An Omnivore

## **Chapter 4:**

- 1) The annual fluctuation in carbon dioxide concentration shown on the graph in figure 4.5 can best be explained by the:
  - A. Deforestation in the tropics
  - B. Regularity of volcanic activity
  - C. El Nino events
  - D. Seasonal photosynthetic activity of green plants
  - E. None of the above
- 2) Due to ever rising concentrations of carbon dioxide, ocean acidification has caused the pH of marine waters to fall well below neutral (pH 7).
  - A. True
  - B. False
- 3) The process by which nitrogen in nitrates is reduced to the gaseous form is called:
  - A. Ammonification
  - B. Nitrification
  - C. Denitrification
  - D. Fixation
- 4) Nitrogen fixation is accomplished by which of the following:
  - A. Bryophytes
  - B. Cyanobacteria
  - C. Algae
  - D. Protozoa
  - E. Fungi
- 5) Which of the following is not a reservoir for phosphorous?
  - A. Water
  - B. Organisms
  - C. Atmosphere
  - D. Rocks
  - E. Soil

- 6) Ammonia is converted to nitrite and nitrate through the process of:
- A. Nitrification
  - B. Nitrogen Fixation
  - C. Denitrification
  - D. Assimilation
  - E. Ammonification
- 7) When Nitrogen is added to aquatic systems, it is least likely to result in:
- A. Depletion of oxygen in the water
  - B. Stimulated algae growth
  - C. Immediate decline in gross primary productivity
  - D. Fish kills
  - E. Aerobic decomposition of dead algae

## **Chapter 15:**

- 1) A symbiotic relationship, such as the interaction between the Hawaiian l'iwi and the lobelia, where both species benefit, is called:
- 2) Epiphytes that grow on taller trees only to obtain light have a \_\_\_\_\_ symbiotic relationship.
- 3) Interspecific competition is \_\_\_\_\_ (More or Less) intense than intraspecific competition.
- 4) The role of an organism in the ecosystem is its \_\_\_\_\_.
- 5) Many ecologists feel that not two species can ever occupy the same niche because of \_\_\_\_\_.
- 6) Explain the differences between a fundamental niche and a realized niche.
- 7) Explain resource partitioning.

## **Chapter 20:**

- 1) DDT is a/an:
  - A. Organophosphate
  - B. Synthetic Botanical
  - C. Narrow-spectrum Pesticide
  - D. Inorganic Compound
  - E. Chlorinated Hydrocarbon
- 2) The techniques of using naturally occurring disease organisms, parasites, or predators to control pests is called:
  - A. Genetic Control
  - B. Biological Magnification
  - C. Biological Amplification
  - D. Bioaccumulation
  - E. Biological Control
- 3) Chemicals that are not readily broken down into less toxic forms are said to exhibit:
  - A. Short-term effects
  - B. Bioaccumulation
  - C. Biological Magnification
  - D. Genetic Resistance
  - E. Persistence
- 4) In the aftermath of Silent Spring the chemical industry argued that policy decisions regarding the application of insecticides should be left up to the technical experts. The industry did not see the issue as being appropriate for debate in a nonscientific public forum.
  - A. True
  - B. False
- 5) Rachel Carson's book Silent Spring was based on original scientific research that she conducted from 1958-1962.
  - A. True
  - B. False
- 6) Rachel Carson was adamantly opposed to the use of any chemicals to control insects.
  - A. True
  - B. False

- 7) In the field of Environmental Toxicology, spectroscopy, simply stated, uses instruments to identify heavy metal pollutants such as lead and mercury by measuring the amount of light absorbed at given wavelengths.
- A. True
  - B. False

## **Chapter 21:**

- 1) In general, what are fossil fuels made of?
- 2) More specifically, what is the difference in the make-up of coal (as it was formed) compared to the composition of oil and natural gas during their formation?
- 3) What difference occurred in the formation of natural gas (methane) as compared to oil?
- 4) Explain what occurred during the formation process to cause coal from Montana to have a lower sulfur content than say, Illinois coal.
- 5) What are two environmental problems associated with the use of nuclear power for generating electricity?
- 6) What is the principal difference between active and passive solar power?
- 7) Distinguish between a direct gain system and an isolated gains system.
- 8) Fuel cells separate electrons from hydrogen atoms via some type of electrolyte and catalyst. The products of the resulting reaction include:
  - A. Water
  - B. Electricity
  - C. Both A and B
  - D. None of the Above
- 9) To provide sufficient fission in a nuclear reactor, the fuel pellets of uranium oxide must have about what percentage of U-235?
  - A. 1%
  - B. 3%-5%
  - C. 15%-20%
  - D. 7%
  - E. 10%

10) Control rods regulate the nuclear reaction by absorbing:

- A. Energy
- B. Heat
- C. Neutrons
- D. Radioactive Wastes
- E. Uranium

11) Active solar power employs direct and isolated gain systems that may utilize south-facing windows and Trombe walls.

- A. True
- B. False