Science 10 Name:

**Ecology Unit 2 Practice Exam**

**Use your data booklet.**

1. The largest store of nitrogen is

* 1. in the atmosphere
  2. in sedimentary rock
  3. in living organisms
  4. in oceans

2. Which of the following is a valid contrast between the phosphorus cycle and the nitrogen cycle?

1. Nitrogen enters terrestrial ecosystems through fertilizers but phosphorus does not.
2. Nitrogen enters the atmosphere through bacterial action but phosphorus does not.
3. Nitrogen enters ecosystems through leaching and run-off but phosphorus does not.
4. Nitrogen enters terrestrial ecosystems through the decay of plant and animal waste but

Phosphorus does not.

3. Which of the following events has the greatest difference between carbon released and carbon stored each year?

1. growth and decay of plant life
2. change in land use for agriculture
3. gas exchange at the surface of the ocean
4. circulation of intermediate and deep ocean water

4. Which of the following processes adds carbon dioxide to the air?

1. Respiration
2. Photosynthesis
3. Nitrification
4. Nitrogen Fixation

5. Which symbol represents ammonium?

1. NO3
2. NO2
3. N2
4. NH4+

6. Which of the following converts nitrates and nitrites into nitrogen gas?

1. denitrifying bacteria
2. nitrogen-fixing bacteria
3. nitrifying bacteria
4. Rhizobium bacteria

7. Physical weathering can occur through

1. wind
2. freeze and thaw
3. rain
4. chemicals

8. Which of the following brings about chemical changes on the surface of rocks?

1. shrubs
2. lichen
3. moss
4. tree roots

9. “This nutrient is the most prevalent gas in Earth’s atmosphere. It cycles through ecosystems via plants. Unusable in its normal form, once it is converted by lightning in the atmosphere or special bacteria in the soil or water it is absorbed by plants and enters food webs. Human activities, such as the burning of fossil fuels, and the use of fertilizer in agriculture, have more than doubled the amount of the nutrient in the biosphere in the past 50 years.”  
  
Which nutrient does the above paragraph refer to?

1. Water
2. Nitrogen
3. Carbon
4. Phosphorous

**Were Volcanoes the Crucible of Life?**

New research by scientists shows that volcanoes produce large quantities of biologically available nitrogen. Some bacteria and fungi have evolved the ability to fix nitrogen themselves, and these biological processes, along with mankind’s activities (such as the burning of fossil fuels), are the major sources of fixed nitrogen in present-day ecosystems. Where did the nitrogen that enabled life to evolve come from in the first place? Previously, lightning and asteroid impacts have been suggested as the major fixed nitrogen sources in the Earth’s atmosphere of about three billion years ago; volcanism had not previously been thought of as an important process. New work shows that the high temperatures associated with volcanic activity might also have played an important role in helping to fix nitrogen. Higher levels of fixed nitrogen were found in volcanic plumes than in the surrounding air. This shows that the heat from volcanoes allows the nitrogen and oxygen in the atmosphere to react together to form fixed nitrogen. The results suggest that volcanism may have been at least as important as lightning and asteroid impacts in converting atmospheric nitrogen into fixed nitrogen on the early Earth.

10. Which of the following statements describes nitrogen fixation in an active volcanic environment?

1. Heat from the volcano provides the energy to fix nitrogen.
2. Plants growing on cooling ash flows have the ability to fix nitrogen.
3. The burning of organic material on the slopes of volcanoes fixes nitrogen.
4. Bacteria and fungi on the flanks of the volcano have the ability to fix nitrogen.

11. Which of the following will remove carbon dioxide from the atmosphere?

1. Planting trees
2. Burning a forest
3. Cutting down trees
4. Maintaining a mature forest
5. I and IV only
6. II and III only
7. III and IV only
8. I, III and IV only

12. What kind of succession begins on bare rock after glaciers have passed or on newly formed volcanic islands, and how long does it take?

1. primary and occurs over decades
2. primary and occurs over centuries
3. secondary and occurs over decades
4. secondary and occurs over centuries

13. Primary succession would occur in which of the following locations?

* 1. a neglected yard
  2. abandoned farmland
  3. a clear-cut area due to logging
  4. an area covered with lava that has cooled after a volcanic eruption

14. For many decades, certain parts of northern Canada have remained boreal forests containing predominantly coniferous trees, such as black spruce, white spruce, and balsam fir. These forests will most likely do which of the following?

1. reach maturity and remain unchanged
2. remain unchanged and not be affected by environmental conditions
3. continue in their present state unless affected by a major abiotic factor
4. be destroyed by a destructive environmental event and never return to their present state

15. Why are organisms like lichens called “pioneer” species?

1. Lichens always grow towards the west side of rocks, moving like pioneers used to
2. Once nutrient sources have been established, pioneer species move into an area
3. Species like these are the first to arrive and successfully survive and reproduce in an area
4. Decomposer species like lichens thrive in areas where weak organisms are trying to survive

16. In primary succession, producers are very important for their ability to capture and pass along solar energy. Where does the soil that plants need to grow in come from?

1. Lichens and other pioneer species break down rocks into smaller parts, and add to the organic content of the soil as they themselves die and decompose
2. After many traveling animal species die and decompose in a barren area, soil begins to form
3. Wind and gravity push soil particles along until they pile into usable areas for plant growth
4. Sudden events like volcanic eruptions and earthquakes release soil and ash to the surface

17. When does an area have the largest number of species?

1. During secondary succession
2. After a natural disaster
3. During primary succession
4. During a climax community

18. An introduced species …

1. is always a bad thing
2. is always considered an invasive species
3. is always a good thing
4. can have little or no effect on an ecosystem

19. Invasive species can alter habitats by:

1. Outcompeting native organisms
2. Preying on native organisms
3. Altering the habitat of native organisms
4. All of the above

20. Which of the following occurs when an invasive foreign species is introduced into an existing ecosystem?

|  |  |
| --- | --- |
| I. | Foreign species can improve the stability of the habitat. |
| II. | Foreign species can disrupt the biotic components of the ecosystem. |
| III. | Foreign species can make the natural habitat unsuitable for native species. |

* 1. I. and II. only
  2. I. and III. only
  3. II. and III. only
  4. I., II., and III.

21. Tsunamis can result in:

1. Destruction of habitat
2. Changed composition of soil
3. Lots of salt water left behind
4. Mud slides

22. Purple loosestrife was accidentally brought from Europe to North America in the early 1800s. It has destroyed North American wetlands by choking out plants, such as cattails, in the area. To restore the wetland ecosystem, the European leaf-feeding beetle was brought in to eat away at the purple loosestrife. The beetle is slowly restoring the wetland ecosystem that the purple loosestrife damaged. Cattails that once grew in the wetland are finally coming back, and the habitat is now able to support a diversity of wildlife.

Which of the following correctly matches the organisms described above with their role in the wetland ecosystem?

|  |  |  |  |
| --- | --- | --- | --- |
|  | Purple Loosestrife | Cattails | European Leaf-feeding Beetle |
| a) | native species | biological control | introduced species |
| b) | native species | introduced species | biological control |
| c) | introduced species | native species | biological control |
| d) | introduced species | biological control | native species |

23. Which of the following has contributed to the mountain beetle infestation in the lodge pole pine forests of British Columbia?

|  |  |
| --- | --- |
| I. | the suppression of forest fires |
| II. | a below-average amount of precipitation |
| III. | milder winters due to a warming trend in the climate |

* 1. I. and II. only
  2. I. and III. only
  3. II. and III. only
  4. I., II, and III.

24. Which of the following are results of massive deforestation?

|  |  |
| --- | --- |
| I. | soil erosion |
| II. | increase in temperature |
| III. | reduction in the number of plants and animals in an ecosystem |

* 1. I. and II. only
  2. I. and III. only
  3. II. and III. only
  4. I., II, and III.

25. Which of the following natural phenomena is most likely to cause widespread disease in human populations?

* 1. fire
  2. flooding
  3. mudslide
  4. timber pest infestation

26. The Cree of Alberta and some of the First Nations of British Columbia use controlled burning to renew ecosystems. Which of the following are benefits of this practice?

|  |  |
| --- | --- |
| I. | Burning improves and increases the growth of desired plants. |
| II. | Burning recycles nutrients and creates more diversity in the under storey of a forest. |
| III. | Burning reduces forest litter and opens the canopy, allowing plants that require more sunlight to grow in the under storey. |

* 1. I. and II. only
  2. I. and III. only
  3. II. and III. only
  4. I., II, and III.