

Name \_\_\_\_\_ School \_\_\_\_\_

TAMS Tournament 2013

Environmental Science Test

Instructions:

You have 50 minutes to complete 50 multiple-choice, matching, and True/False questions.  
Please select the choice ***most*** appropriate.

Only correct answers will be counted.

There is no penalty for guessing.

You may not write on the test.

1. Which of the following is not a major oceanic current?
  - a. Indian Ocean Subtropical Gyre
  - b. South Pacific Subtropical Gyre
  - c. Labrador Current
  - d. Atlantic Ocean Subtropical Gyre

For Questions 2 – 5, please match the biome to the animal.

- a. Tropical Forest
  - b. Northern Coniferous Forests
  - c. Grasslands
  - d. Chaparral
2. Jackrabbits
  3. Prairie Dogs
  4. Brown Bears
  5. Bengal Tiger

6. Which of the following statements is true?
  - a. Westerlies move from East to West, Tradewinds move from West to East
  - b. Westerlies are near the equator, Tradewinds are further from the Equator
  - c. Westerlies move from West to East, Tradewinds move from East to West
  - d. None of the Above
7. Based on concentrations in the atmosphere, which of the following compounds contributes most to the acidity rain?
  - a. CO<sub>2</sub>
  - b. NO<sub>2</sub>
  - c. O<sub>3</sub>
  - d. SO<sub>2</sub>
8. Of the following, which element is most responsible for Algal Blooms?
  - a. Oxygen
  - b. Nitrogen
  - c. Sulfur
  - d. None – Chemical are not responsible, only sunlight is necessary
9. What is the current demographic state of Mexico?
  - a. Zero population growth – High births and deaths
  - b. High deaths, low births
  - c. Zero population growth – Low births and deaths
  - d. Low deaths, high births
10. Competition, predation, and symbiosis fall under what type of ecology?
  - a. Community Ecology
  - b. Population Ecology
  - c. Organismal Ecology
  - d. Ecosystem Ecology

For questions 11-13, answer True (a) or False (b)

11. Keystone species can be carnivores, herbivores, or photosynthetic
  - a. True
  - b. False
12. Dominant species exhibit top-down control
  - a. True

- b. False
- 13. Primary Consumers can have more mass than Primary Producers
  - a. True
  - b. False
- 14. Which is the correct order for ecological succession?
  - a. Pioneer, Alder, Spruce, Dryas
  - b. Pioneer, Spruce, Dryas, Alder
  - c. Pioneer, Dryas, Alder, Spruce
  - d. Pioneer, Dryas, Spruce, Alder
- 15. John gives Jill food, while Jill teaches John with his homework. The following example is
  - a. Competition
  - b. Symbiosis
  - c. Mutualism
  - d. Both B and C
- 16. The conversion of nitrogen to ammonia occurs through all of the following except
  - a. Haber Process
  - b. *Rhizobium*
  - c. Lightning
  - d. Ozonolysis
- 17. Which of the following gases/vapor is a greenhouse gas?
  - a. Oxygen
  - b. Water vapor
  - c. Ammonia
  - d. Chlorine
- 18. A certain species of chickens in Texas is going extinct, with only 50 chickens left. What is the best way to help the population rebound?
  - a. Provide adequate food and resources
  - b. Put all the chickens in a reserve to keep them safe from predators
  - c. Add chickens from Europe into the Texas populations
  - d. Clone all the chickens
- 19. The Kyoto Protocol is ratified by all of the following except...
  - a. Russia
  - b. Turkey
  - c. Australia
  - d. United States
- 20. Which represents the chemical refinement of Uranium?
  - a.  $\text{UO}_2 \rightarrow \text{U}_3\text{O}_8 \rightarrow \text{UF}_6 \rightarrow \text{UF}_6$  (Uranium-235)
  - b.  $\text{UO}_2 \rightarrow \text{U}_3\text{O}_8 \rightarrow \text{UF}_6 \rightarrow \text{UF}_6$  (Uranium-238)
  - c.  $\text{U}_3\text{O}_8 \rightarrow \text{UO}_2 \rightarrow \text{UF}_6 \rightarrow \text{UF}_6$  (Uranium-238)
  - d.  $\text{U}_3\text{O}_8 \rightarrow \text{UO}_2 \rightarrow \text{UF}_6 \rightarrow \text{UF}_6$  (Uranium-235)
- 21. What is the lowest carbon content for these coal types?
  - a. bituminous
  - b. anthracite
  - c. lignite
  - d. subbituminous
- 22. At what range of wavelength does  $\text{O}_2$  dissociate into two oxygen atoms?
  - a. 99-167nm
  - b. 180-242nm
  - c. 245-301nm
  - d. 306nm-389nm
- 23. Of the following factors that regulate population growth, which is NOT density dependent?
  - a. Territoriality
  - b. Resources

- c. Drought
  - d. Disease
24. Which type of survivorship curve occurs among humans and many other large mammals?
- a. Type I
  - b. Type II
  - c. Type III
  - d. Both A and C
25. One species of a forest bird is highly territorial. What pattern of dispersion would this species most likely display?
- a. Clumped
  - b. Uniform
  - c. Random
  - d. Scattered
26. Which of the following contains only abiotic factors?
- a. Moisture, disease, light
  - b. Oxygen, salinity, competition
  - c. Nutrients, parasites, soil pH
  - d. Temperature, fire, water
27. The Southern Hemisphere has the longest day and shortest night during
- a. March equinox
  - b. June solstice
  - c. September equinox
  - d. December solstice
28. The climate of southern California is most similar to the climate of which region?
- a. Texas
  - b. Mediterranean Sea
  - c. Gobi Desert
  - d. Caribbean Islands
29. Which of the following statements regarding seasonal turnover is correct?
- a. In winter, the lake is stratified by temperature.
  - b. In summer, the lake waters are well oxygenated at all depths.
  - c. In spring, the coldest water in the lake lies just below the surface.
  - d. In autumn, the lake contains a thermocline, a narrow vertical zone of abrupt temperature change.
30. Which marine zone is made up of mostly sand, organic sediments, and detritus?
- a. Aphotic zone
  - b. Benthic zone
  - c. Oceanic zone
  - d. Pelagic zone
31. The biome with the lowest annual mean temperature and precipitation is
- a. Temperate grassland
  - b. Northern coniferous forest
  - c. Arctic tundra
  - d. Desert
32. The exponential growth model
- a. produces a S-shaped growth curve.
  - b. assumes that resources are unlimited.
  - c. factors in the carrying capacity of an environment.

- d. is useful for estimating sustainable harvest rates of wildlife populations.

For questions 33-37, answer True (a) or False (b).

33. K-selection occurs in environments in which population densities are well below carrying capacity.  
a. True  
b. False
34. Three-quarters of today's emerging human diseases, including mad cow disease, are caused by zoonotic pathogens.  
a. True  
b. False
35. Species richness generally increases along a latitudinal gradient from the tropics to the poles.  
a. True  
b. False
36. Disturbance and lack of equilibrium are the norm for most communities.  
a. True  
b. False
37. Biological magnification can occur with chlorinated hydrocarbons.  
a. True  
b. False
38. How efficient is energy transfer between trophic levels typically?  
a. 5%  
b. 10%  
c. 25%  
d. 50%
39. Which of the following statements are true:  
I. Earth's human population is currently growing exponentially.  
II. Most of the current population growth is occurring in less industrialized countries.  
III. The age structure for U.S. is relatively even except for a "baby boom".  
a. I and II  
b. II and III  
c. I and III  
d. I, II, and III
40. What is the single greatest threat to biodiversity on Earth?  
a. Overexploitation  
b. Habitat loss  
c. Pollution  
d. Introduced species
41. The small-population approach to population conservation  
a. emphasizes the environmental factors that caused a population decline.  
b. focuses on endangered populations that show a downward trend.  
c. involves increasing the genetic variation of an endangered population.  
d. removes the suspected agent of decline to see if endangered population rebounds.
42. Movement corridors can  
a. facilitate the movement of disease-carrying ticks.  
b. reduce inbreeding in declining populations.  
c. be artificially constructed in areas of heavy human use.

- d. All of the above
43. Adding mycorrhizal symbionts to systems where the soil has been severely disturbed is an example of
- a. Bioremediation
  - b. Sustainable development
  - c. Biological augmentation
  - d. A and C
44. The ozone layer is located in which layer of the atmosphere?
- a. Thermosphere
  - b. Mesosphere
  - c. Stratosphere
  - d. Troposphere
45. According to the green world hypothesis, why do herbivores consume such a small fraction of plants' net primary production?
- I. Plant defenses
  - II. Low nutrient concentrations
  - III. Interspecific competition
- a. I and II
  - b. II and III
  - c. I and III
  - d. I, II, and III
46. Where are the largest accumulations of phosphorus located?
- a. Sedimentary rocks
  - b. Soil particles
  - c. Oceans
  - d. Organisms

For questions 47-50, match the animal with its defensive adaption.

- a. Cryptic coloration
  - b. Aposematic coloration
  - c. Batesian mimicry
  - d. Mullerian mimicry
47. A cuckoo bee and yellow jacket, two unpalatable species, are mimics of each other.
48. A poison dart frog's bright color pattern warns potential predators.
49. A black witch moth's wings blend into the color of the bark of the trees.
50. A harmless king snake mimics the coloration of the venomous coral snake.