

READ THE DIRECTIONS

BIOLOGY: A HUMAN APPROACH EXAMINATION I NAME _____

EBIO 1030, SECS. #0001 & #0002

1 Oct. 2007

INSTRUCTIONS: Use a **SOFT-LEAD** pencil (#1 or #2) for writing in and mark-sensing your name, CU I.D. number (not your SS#), lecture section number and answers on the exam answer sheet, erasing completely when necessary. For the lecture section, use either 0001 or 0002 in the “1,2,3,4” slot on the top left of the sheet. An answer key and test scores will be posted in the glass cabinet at the foot of the stairway in Ramaley across from room **N1B54 (=N.E. corner basement)**, hopefully, by Wednesday noon. Be sure to guess any time you don't know an answer. There are no deliberately tricky questions, so if something doesn't make sense to you, ask one of the proctors. On the bottom of your **answer sheet** you may defend your answer to any question you feel is ambiguous, but you must **FIRST** mark-sense your best guess among the choices. To ensure your not running out of time, complete the entire exam before defending a specific answer. Expect to have the equivalent of one question deducted from your exam score if you are **not** taking the exam in the proper location!

You are **not** to use any iPods or cell phones during the exam. Your cell phone is to be turned off and if you must wear a hat, turn the bill to the back. There cannot be any ear phones, ear pieces, *etc.*, in or around your ears at any time. Any answers you have put on your answer sheet or exam are to be covered in such a way that no one can see them.

STOP – MAKE SURE YOU ARE SITTING IN THE PROPER LECTURE HALL.

The 9:30 a.m. TR LECTURE SESSION should be in CHEM 142 = Sec. #0001

The 12:30 p.m. TR LECTURE SESSION should be in CHEM 140 = Sec. #0002

KEEP YOUR ANSWERS AND ANSWER SHEET COVERED AT ALL TIMES.

1. Living communities interacting with themselves and their non-living environment would most appropriately be referred to as:

- A) Trophic levels B) Consumers C) Ecosystems D) Populations E) Food chains

2. Which is **FALSE**?

- A) It is estimated that at least 1% of all humans who have ever been alive on earth are alive today.
B) Of about 60,000 different science periodicals (journals) in existence today, 25,000 of them are on biological subjects.
C) The estimated number of different species on earth would be between 1 and 10 million.
D) As related to other species on earth, humans have been around a long time.
E) It has been estimated that humans compose about 10% of the total animal biomass in terrestrial ecosystems today.

3. Which of the following relationships is **FALSE**?

- A) Cellular organelles make up cells. D) Atoms make up molecules.
B) Organs make up tissues. E) Individuals of the same species make up populations.
C) Communities are a part of ecosystems.

4. Ecology is the study of all the following **EXCEPT**:
- A) Relationships between organisms and their environments
 - B) Populations of individuals
 - C) Communities of various species (populations)
 - D) Molluscs dependent upon their calcium carbonate shells
 - E) Biotic communities and their relationship with the non-living (abiotic) environment
5. Environmental management would **most** appropriately involve which of the following?
- A) Population ecology
 - B) Forestry
 - C) Endangered species
 - D) Community ecology
 - E) Anthrobiogeochemical cycles
6. All of the following elements constitute at least 2 % of the human body **EXCEPT**:
- A) Ca – calcium
 - B) N – nitrogen
 - C) Fe – iron
 - D) H -- hydrogen
 - E) O – oxygen
7. All of the following attributes of water help account for its movement from the root hairs to the upper parts of tall trees **EXCEPT**:
- A) High cohesive qualities
 - B) Ease of forming oxygen-to-oxygen bonds
 - C) High adhesive qualities
 - D) Easily sticks to other things
 - E) Exhibits capillarity
8. Which of the following statements about water is **FALSE**?
- A) It has a high heat capacity.
 - B) It contracts when freezing.
 - C) It has a high surface tension.
 - D) It is most dense at 4 degrees C.
 - E) It has a high heat of vaporization.
9. The *seasons* we experience on earth would be mostly dependent upon which of the following earth characteristics?
- A) The rotation of the earth on its axis.
 - B) The moon's having a radius about $\frac{1}{4}$ that of earth.
 - C) The earth's rotating around the sun.
 - D) The earth's rotating on a **tilted** axis.
 - E) The earth's surface being 71% water.
10. Of the anthrobiogeochemical cycles discussed in class, the one that lacks a gaseous stage and is the most problematical in terms of completing the cycle is the:
- A) Nitrogen cycle
 - B) Phosphorus cycle
 - C) Oxygen cycle
 - D) Water cycle
 - E) Carbon cycle
11. Which of the following statements is **FALSE**?
- A) Wind driven ocean currents are deflected to the right in the southern hemisphere.
 - B) Wind driven ocean currents are deflected to the right in the northern hemisphere.
 - C) Thirty degrees north and south latitude is where most of the deserts are found on earth.
 - D) Most of the water vapor generated by evaporation in the tropics condenses and falls back into the oceans as rain.
 - E) The prevailing wind patterns on earth are mostly predictable.

12. Which is **FALSE** ?
- A) Bacteria are the major decomposers of animal tissues.
 - B) Fungi are the major decomposers of plant tissues.
 - C) Scavengers often help reduce the bulk of dead animal tissues.
 - D) Beetle and fly larvae are major detritus feeders on dead animals.
 - E) The energy of the dead animal is recycled by the detritus feeders and bacteria back through the anthrobiogeochemical cycles to the autotrophs.
13. A decline in the herring and perch populations along the west coasts of North and South America due to over fishing has caused all of the following **EXCEPT**:
- A) A decline in the sea otter populations.
 - B) A decline in the seal and sea lion populations.
 - C) A decline in the kelp forests.
 - D) A decline in many fish species dependant upon kelps.
 - E) A decline in the sea urchin population.
14. Given an idealistic food chain of wheat, grasshoppers, mice, snakes and hawks in which the total mass of all the consumed wheat amounted to 100,000 pounds, what would be the estimated weight of all the hawks in this ecosystem?
- A) 10,000 lbs.
 - B) 1000 lbs.
 - C) 100 lbs.
 - D) 10 lbs.
 - E) 1 lb.
15. All of the following are **true** about biomagnification **EXCEPT**:
- A) The toxin must not be metabolized by the organisms.
 - B) Concentrations of the toxins are lower in the environment than they are in the food chains.
 - C) Larger fishes would tend to have larger concentrations of the toxins than smaller fishes.
 - D) Birds of prey have been particularly compromised by high concentrations of DDT.
 - E) The toxin must not be soluble in fats.
16. Which is **FALSE** ?
- A) The universal energy-transfer molecules in all cells is ATP.
 - B) Most water evaporated from the surface of the earth falls as rain over the oceans.
 - C) Weathering is defined as the abiotic disintegration of the lithosphere *via* interaction with atmosphere and hydrosphere.
 - D) Burning fossil fuels has significantly increased the atmospheric carbon dioxide in recent times.
 - E) The primary **structural** units of all living cells are nucleic acids.
17. The number of frogs per acre of marshland would be a measure of:
- A) Raw distribution
 - B) Random dispersion
 - C) Ecological dispersion
 - D) Ecological density
 - E) Raw density
18. On the second week of trapping, a biologist captures 125 mice -- 25 of which she had previously marked. The first week she had set 150 traps, caught, marked and released 50 mice. What is the estimated mouse population in her study area?
- A) 2000
 - B) 1500
 - C) 1000
 - D) 500
 - E) 250
19. The maximum population supportable by the environment on a long-term basis is called:
- A) Survivorship
 - B) Reproductive strategy
 - C) Maximum recruitment
 - D) Carrying capacity
 - E) None of the above

20. With respect to density-independent (DI) and density-dependent (DD) mechanisms of population control, which is **FALSE** ?
- A) DD mechanisms tend to be more stabilizing.
 B) Competition would be a DD mechanism.
 C) DD mechanisms often result in growth/crash/growth/crash cycles.
 D) DI mechanisms often involve disasters.
 E) DD mechanisms tend to involve other organisms.
21. Similar species of birds inhabiting the same trees can coexist and thrive because:
- A) Competition keeps them apart D) Social dominance keeps them apart
 B) They occupy different niches E) They exemplify the “competitive exclusion principle.”
 C) They occupy different territories
22. All of the following are true about **territoriality EXCEPT**:
- A) The most aggressive individuals command the best territory.
 B) The less aggressive individuals are forced into marginal areas.
 C) Territoriality prevents overexploitation of the habitat.
 D) The home range may or may not be defended.
 E) This system promotes aggression.
23. Probable factors contributing to the lack of human population control would include all of the following **EXCEPT**:
- A) We have never reached our carrying capacity (K).
 B) We have been able to increase our carrying capacity.
 C) Our population can be manipulated by both birth rate and death rate controls.
 D) Our evolutionary history has been too short.
 E) Most of our population controls are probably density-independent factors.
24. All of the following would be a part of the reproductive strategy **EXCEPT**:
- A) How many offspring does an individual have?
 B) For how long is parental care provided?
 C) What type of dispersion does the population exhibit?
 D) At what age do adults become mature?
 E) How often do the individuals breed?
25. Plotting the number of **ant** species on the vertical axis and latitude on the horizontal axis in the western hemisphere with north on the left, south on the right and the equator in the middle, which of the following plots would most likely represent their diversity?
- # # # # #
- A) _____ B) _____ C) _____ D) _____ E) _____
 n e s n e s n e s n e s n e s
26. All of the following would be part of “Community Ecology” **EXCEPT**:
- A) Limits of Tolerances B) Symbioses C) Ecotones D) Succession E) Age structure

27. Moist air from the west pushing against the Rocky Mountains causes all of the following **EXCEPT**:
- A) The air to rise and cool
 - B) Most of the rainfall to be on the western slope
 - C) Air to descend and warm after passing over the Rockies
 - D) A “rain shadow” on the western slope
 - E) Semi arid conditions on the eastern slope
28. Using F = firs, S = shrubs and A = aspen, select the successional sequence after a disturbance one might likely observe in the sub-alpine area of Colorado.
- A) A→S→F B) F→A→S C) S→A→F D) S→F→A E) F→S→A
29. Which is **FALSE**?
- A) Ecological succession is defined as a predictable series of stages a community goes through upon being disturbed.
 - B) A secondary succession would tend to have more steps or stages than a primary succession.
 - C) The successional stages of a disturbed community are both predictable and repeatable.
 - D) The end point of a succession is called the “climax community.”
 - E) Forest logging to clear land for crops would result in a secondary succession.
30. Which is **FALSE** about successional changes?
- A) The first species to arrive must be easily dispersed and quick to establish itself.
 - B) Early species create an environment more favorable for the next stage than for themselves.
 - C) Later species create an environment causing the exclusion of earlier species.
 - D) In effect, the food chains are driving succession.
 - E) The climax community is uniquely different from preceding stages because it can replace itself.
31. Which of the following is **NOT** among the adaptations organisms have for fire?
- A) Thick bark on trees such as the redwoods
 - B) Seeds that germinate only after burning
 - C) Non-woody plants which grow low to the ground and germinate only every three years
 - D) Roots, such as the aspen, that sprout quickly after a fire
 - E) Grasses with their growing parts under ground
32. Which of the following US localities would most accurately describe where deforestation took place between the years 1620 – 1920?
- A) The Great Lakes D) Eastern US
 - B) West Coast E) Kansas, Nebraska and the Dakotas
 - C) Rocky Mountains
33. All of the following factors are, or have been, **decreasing** here in the US **EXCEPT**:
- A) The amount of forested land
 - B) The extent of the unpolluted underground aquifers
 - C) The thickness of the agricultural soils
 - D) The pH of the rainfall in the eastern states
 - E) The concentration of carbon dioxide in the atmosphere

34. Which of the following is **FALSE**?
- A) Almost all areas of the world are projected to be drier than they are now as a result of global warming.
 - B) About 50% of the earth's land is unsuitable for any economic use.
 - C) In the last century, more than 20 north Atlantic fisheries have been depleted.
 - D) The explosion of the Chernobyl nuclear plant in 1986 spread radioactive contamination all the way around the northern hemisphere.
 - E) While constituting only 5% of the world's population, the US generates 72% of the world's hazardous wastes.
35. Which of the following statements is **false**?
- A) Fertility rates are rising in sub-Saharan Africa.
 - B) More education tends to lower fertility rates.
 - C) The fertility rate in the US is about 2.1.
 - D) Fertility rates are falling in North America.
 - E) Fertility rates are falling in Europe.
36. The exponential rise in human population growth began:
- A) About the middle of the Agriculture revolution
 - B) With the beginning of the Agriculture revolution
 - C) About 10,000 years ago
 - D) About 3,000 years ago
 - E) About 500 years ago
37. Of the following regions, which one is experiencing a growth rate of less than 2% per year?
- A) The area around the Red Sea
 - B) South Africa
 - C) Central America
 - D) India
 - E) East Africa
38. Which of the following categories has experienced a significant **decrease** in the last few decades?
- A) Industrial output per capita
 - B) Available resources
 - C) Human population
 - D) Pollution
 - E) Food per capita
39. All of the following would be characteristics of Human Population Ecology **EXCEPT**:
- A) Growth curve in a steep exponential climb
 - B) Fertility rates that are beginning to decrease
 - C) Well defined reproductive strategy.
 - D) Long post-reproductive lifespan.
 - E) Strong Type I (convex) survivorship curve.
40. For the world human population to double from 2 billion to 4 billion took an estimated how many years?
- A) 350
 - B) 200
 - C) 130
 - D) 100
 - E) 50