

BIOLOGY: A HUMAN APPROACH, EBIO 1030 - EXAM I

Sept. 27, 2010

NAME _____

READ THE DIRECTIONS

INSTRUCTIONS: Use a **SOFT-LEAD** pencil (#1 or #2) for writing in and mark-sensing your name, CU I.D. number, 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)** as soon as they are available, 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 lecture hall!

Your cell phone is to be turned off and if you must wear a hat, turn the bill to the back. You are **not** to use iPods, cell phones, digital media players, Zunes, Blackberries, computers or calculators during the exam. 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, and do not let your eyes wander.

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

The 9:00 a.m. TR LECTURE SESSION (#0001) use DUAN G1B20

The 12:30 p.m. TR LECTURE SESSION (#0002) use DUAN G1B30

Please spread out as much as possible in these lecture halls.

KEEP YOUR ANSWERS AND ANSWER SHEET COVERED AT ALL TIMES.

- Living communities interacting with themselves and their non-living environment would most appropriately be referred to as:
A) Anthrobiogeochemical cycles B) Biomes C) Ecosystems D) Populations E) Food chains
- Applied ecology or environmental management would include the study of all of the following **EXCEPT**:
A) Ecosphere C) Sanitary engineering E) The protein content of corn crops
B) Forestry D) Agriculture

KEEP YOUR ANSWERS AND ANSWER SHEET COVERED AT ALL TIMES.

3. 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
4. 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.
5. Within the "Hierarchical Levels of Organization (Integration)," the building blocks of *cells* would be:
- A) Tissues B) Cellular organelles C) Atoms D) Molecules E) Molecular systems
6. Sea water constitutes about 97% of the earth's total water. Rivers and lakes constitute about how much of the earth's total water?
- A) 3% B) 2 % C) 1 % D) 0.5% E) 1/50 of 1%
7. 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.
8. The energy of the sun powers or drives all of the following **EXCEPT**:
- A) Anthrobiogeochemical cycles.
 B) The earth's ocean currents.
 C) The earth's energy cycle.
 D) The earth's weather patterns.
 E) Air movements over the earth's surface.
9. Which is **FALSE**?
- A) Destroying certain bacteria populations would likely compromise the global phosphate cycle.
 B) Phosphate and nitrate are commonly used as commercial fertilizers.
 C) A hundred years ago livestock manures were recycled as fertilizers for crops.
 D) Water soluble phosphate fertilizers are often leached out of the soil and become lost to rivers and oceans.
 E) People are commercially mining as much phosphorus today as is naturally supplied to the ecosystems by way of weathering and decomposition.
10. Which of the following is **FALSE** ?
- A) The energy of the sun creates air movements on the earth's surface.
 B) Air movements create ocean waves.
 C) Air movements help drive ocean currents.
 D) The sun provides the energy to drive the hydrologic cycle.
 E) The eastward rotation of the earth is primarily responsible for weather patterns and climate.

KEEP YOUR ANSWERS AND ANSWER SHEET COVERED AT ALL TIMES.

11. Which is **FALSE**?
- A) Most of the moisture in the air at the tropics falls as rain in the tropics.
 - B) Most of the deserts in the world are located at about 30 degrees north and south latitude.
 - C) Water pushed by the wind in the northern hemisphere is deflected to the left.
 - D) Major ocean currents in the northern hemisphere circle clockwise.
 - E) A cannonball shot due north from the equator would veer to the east.
12. 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 gain of all the hawks in this ecosystem?
- A) 10,000 lbs.
 - B) 1000 lbs.
 - C) 100 lbs.
 - D) 10 lbs.
 - E) 1 lb.
13. 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.
14. Large pulses of sound generated under water in the southern Indian Ocean have been detected in all of the following locations except:
- A) US west coast
 - B) US east coast
 - C) New Zealand
 - D) The Antarctic coast south of South America
 - E) Indonesia
15. The basic unit of **evolution** is the:
- A) Individual
 - B) Family
 - C) Extended family
 - D) Community
 - E) Population
16. All of the following would be attributes of a **population EXCEPT**:
- A) Age structure
 - B) Succession
 - C) Carrying capacity
 - D) Survivorship
 - E) Reproductive "strategy"
17. 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
18. The mouse population in your study area is estimated to be 400, and its growth rate is 7% per year. In how many years would you expect the population to reach 800?
- A) 5
 - B) 7
 - C) 10
 - D) 14
 - E) 20
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

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 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 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
30. Of the following natural communities, which would be the **least** valuable for converting to economic crops?
- A) Oaks B) Sagebrush C) Firs D) Spruce E) Maples
31. All of the following are behaviorally similar to one another **EXCEPT**:
- A) Aardvark B) Hyena C) Anteater D) Pangolin E) Armadillo
32. All of the following are true about human population ecology **EXCEPT**:
- A) Growth curve in a steep exponential climb
 - B) High biotic potential
 - C) Negative correlation between population density and fertility rate
 - D) No obvious reproductive strategy
 - E) No clear indication of carrying capacity
33. Percentage-wise, which of the following areas is presently experiencing the most rapid population increase?
- A) China B) India C) East Africa D) Brazil E) Scandinavia
34. A region of the world with **low** growth rate followed by one with a **high** growth rate would be represented by which of the following combinations?
- A) Central America – Middle East D) Australia – Mexico
 - B) United States – New Zealand E) NW South America – Africa
 - C) Canada – Europe
35. Which of the following areas has the highest incidence of HIV / AIDS ?
- A) Mexico C) India E) European Eastern Block Countries

B) Oceania

D) East Africa

36. 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.

37. Of the 5 most populated countries in the world today, which one is expected to fall off that list by the year 2050?

- A) Nigeria
- B) Indonesia
- C) United States
- D) Bangladesh
- E) Pakistan

38. Age structure diagrams are useful in indicating all of the following **EXCEPT**:

- A) The proportion of males and females at birth.
- B) The cultural influence of environmental resistance
- C) A long post-reproductive life span.
- D) The move of a population bulge (baby boomers) through time.
- E) The proportional size of the pre-reproductive group.

39. Which area of the world is exhibiting a decline in population?

- A) Europe
- B) United States
- C) Mid east
- D) Oceania
- E) USSR

40. 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