

Biology 142 - General Biology  
Spring 2008 - Dr. Carey - Final Exam

Part I - Multiple choice - 1 pt. each.

1. All of the organisms inhabiting an area make up a(n) \_\_\_\_\_ in that area.  
A) ecosystem B) community C) population D) species E) biome F) biosphere
2. The organisms in question 1 interacting with the non-living environment collectively compose the \_\_\_\_\_ in the area. (Use the same choices as in question 1)
3. When both species benefit from an interaction, it is called: A) symbiosis  
B) mutualism C) cooperation D) commensalism E) competition
4. When both species are harmed in an interaction, it is called: \_\_\_\_\_ (Use the choices in question 5)
5. In the nitrogen cycle, \_\_\_\_\_ is the form of environmental nitrogen that is most readily usable to producer organisms. A)  $N_2$  B) ammonia C) nitrate D) nitric acid  
E) amino acids
6. On the average, about \_\_\_\_\_% of an organism's gross energy intake is never assimilated.  
A) 10 B) 20 C) 30 D) 40 E) 50 F) 60
7. "X" is the amount of energy taken in by producers in photosynthesis. How much energy would likely be available to primary consumers? A) X B) 0.1X C) 0.01X  
D) 0.001X E) 0.0001X
8. Factors that cause an increase in mortality with increasing population size (density) are known as: A) K-factors B) density-independent factors C) abiotic factors  
D) non-regulatory factors E) density-dependent factors
9. The two most important factors determining the distribution of life in an aquatic habitat are: A) temperature and precipitation B) pH and temperature C) light and nutrient availability  
D) light and temperature E) surface area and nutrient availability
10. In general, in any ecosystem the number of tertiary consumers will be \_\_\_\_\_ the number of secondary carnivores. A) greater than B) equal to C) less than
11. A human being eating a strictly vegetarian diet would be classified as a(n):  
A) primary consumer B) producer C) primary carnivore D) secondary consumer  
E) more than one of the above
12. An area characterized by falling air is usually: A) very wet B) very cold  
C) very hot D) very dry E) more than one of the above
13. Plasma and interstitial fluids are similar in composition except that plasma has a much higher \_\_\_\_\_ concentration. A) oxygen B) sodium C) potassium D) protein  
E) water

14. The concentration difference described in question 15 is used to \_\_\_\_\_ capillaries. A) move fluid out mainly at the arteriole ends of B) move fluid out mainly at the venous ends of C) return fluid mainly at the venous ends to D) return fluid mainly at the arteriole ends to E) none of the above
15. Tropic hormones are produced by the: A) anterior pituitary B) posterior pituitary C) hypothalamus D) pineal gland E) adrenal medulla
16. The hormones in question 17 have as their primary target the: A) hypothalamus B) anterior pituitary C) posterior pituitary D) other endocrine glands E) the entire body
17. Release of an oocyte from the ovary in mammals is triggered by a great increase (surge) in: A) LH B) GRH C) estrogen D) progesterone E) HCG
18. In humans, the event in question 19 occurs on about day \_\_\_\_ of the menstrual cycle. A) 1 B) 4 C) 14 D) 20 E) 28
19. Which of choices in question 19 is found only in a pregnant woman? \_\_\_\_\_
20. Palisades parenchyma carries out most of \_\_\_\_\_ in a leaf. A) photosynthesis B) phloem transport C) respiration D) transpiration E) chlorophyll synthesis
21. A tissue that provides very strong support for plant parts is: A) xylem B) epidermis C) parenchyma D) collenchyma E) sclerenchyma
22. Regulatory activities in your kidney that maintain chemical homeostasis in your plasma are largely carried out by the: A) glomeruli B) thin loops C) distal tubules D) proximal tubules E) collecting ducts F) more than one of the above
23. Pollen is produced in an: A) ovary B) calyx C) pistil D) anther E) corolla
24. In muscle contraction, tropomyosin inhibition is removed when \_\_\_\_\_ concentration increases in the muscle cell cytoplasm. A) sodium B) chloride C) calcium D) potassium E) protein
25. The large intestine (colon) primarily functions to: A) store food before digestion B) digest proteins C) absorb water D) absorb fats E) digest cellulose
26. An action potential is initiated by a large \_\_\_\_\_ across a neuron membrane. A) inflow of sodium B) outflow of sodium C) inflow of potassium D) outflow of potassium E) inflow of calcium
27. As an action potential is transmitted along a membrane, its voltage strength: A) increases B) stays the same C) decreases

Part II - True-false - 1 pt. each.

1. Mt. Erebus is located on the coast of Antarctica at about 70 degrees S. latitude. We would thus expect its western slopes to get more precipitation than the eastern.
2. If cGMP is a second messenger affecting a certain response in a cell, then cAMP is likely to cause the opposite effect in the same cell.
3. Muscles derive from mesoderm tissue.
4. The endodermis in a root primarily serves as a water filter.
5. At the compensation depth, photosynthetic rates are equal to respiratory rates.
6. When bodies of water are stratified, production of biomass is higher.
7. Water permeability in kidney tissues is primarily affected by the hypothalamic hormone ADH.
8. The sympathetic nervous system usually functions to return the body to normal functioning after completing some stressful activity.
9. A gametophyte is diploid.
10. Humans primarily use negative pressure respiration.
11. The retina in your eye has more rods and cones than it does bipolar cells.

Part III - Fill-in - 1 pt. each.

1. Large differences in the early embryologic stages of animal development are primarily due to differences in the amount of \_\_\_\_\_ in the egg. Species that have extremely large amounts of this substance in their eggs are usually characterized by having \_\_\_\_\_ cleavage. Humans are a species whose eggs have this character \_\_\_\_\_ (true/false)
2. Tropical oceans of the world are permanently \_\_\_\_\_. This means that the surface waters are low in \_\_\_\_\_ and the deep waters are low in \_\_\_\_\_. These deficiencies do not get too extreme in the oceans because of currents coming from polar oceans that are permanently \_\_\_\_\_.
3. Muscles contract when cross-bridges (bonds) form between \_\_\_\_\_ and \_\_\_\_\_ molecules. Energy for the contraction is derived from \_\_\_\_\_ molecules.

4. Closed circulation systems are \_\_\_\_\_ (more/less) efficient than open systems, primarily because they have higher \_\_\_\_\_ than the open systems.
5. The outer-most ring of modified leaves in a flower are typically green-leaf type structures called \_\_\_\_\_. They function to \_\_\_\_\_ . The next ring of modified leaves inward are \_\_\_\_\_ . They function to \_\_\_\_\_ .

Part IV - Short answer - Pts. as indicated.

1. Define: (3 pts each)
- A. respiratory energy
  
  - B. amylase
  
  - C. rain shadow
  
  - D. commensalism
  
  - E. archenteron
  
  - F. temporal summation
  
  - G. ecological pyramid
  
  - H. paracrine hormone
  
  - I. interstitial fluid
  
  - J. hyperpolarization (on a membrane)
  
  - K. association area (in the neocortex)
  
  - L. portal system

M. fecundity

2. Distinguish between: (5 pts each)
- A. protostomes and deuterostomes

B. filtration and reabsorption

C. filtration and secretion (in a kidney)

D. absolute and relative refractory periods

E. seminiferous tubules and interstitial tissue

F. energy flow and nutrient cycling



5. Explain how a countercurrent mechanism can be so efficient in exchanging diffusible materials. Describe one area where such mechanisms are used in your body. (10 pts)

6. Describe the general steps in a negative feedback loop. What is its major function? In flow chart fashion show one hormonally mediated loop. (12 pts)

7. In the following, list the items in order (number of points equals the number of items I am looking for in the list).
- A. Major tube types between pharynx and alveoli (4 pts)
  
  - B. Major organs through which food or food wastes pass from swallowing to defecation (4 pts)
  
  - C. Layers of water in a stratified lake from top to bottom (3 pts)
  
  - D. Parts of a neuron in order of information flow (3 pts)
  
  - E. trophic level names in an ecosystem containing 5 such levels (5 pts)
8. List one **specific** function of each of the following: (2 pts each)
- A. somatic ectoderm
  
  - B. liver
  
  - C. epididymis
  
  - D. bile
  
  - E. guard cell
  
  - F. iris
  
  - G. cleavage
  
  - H. integuments (in a flower)