Test 2 Practice Exam
Biology 215

Multiple choice. Choose the **one** best answer and fill in the letter on your scantron sheet. Make sure to use a number 2 pencil and fill in the dot completely. (1 point each)

1. Most of the water and minerals taken up from the soil by a plant are absorbed by:
   a. taproots
   b. root hairs
   c. the thick parts of the roots near the base of the stem
   d. storage roots
   e. sections of the root that have secondary xylem

2. The photosynthetic cells in the interior of a leaf are what kind of cells?
   a. parenchyma
   b. collenchyma
   c. sclerenchyma
   d. phloem
   e. endodermis

3. All of the following cells are alive in their functional states EXCEPT:
   a. tracheids
   b. sieve tube elements
   c. guard cells
   d. mesophyll cells
   e. vascular cambium cells

4. Wood consists mostly of:
   a. primary xylem
   b. secondary xylem
   c. secondary phloem
   d. mesophyll cells
   e. vascular cambium

5. Which cell is INCORRECTLY matched with its function?
   a. mesophyll : photosynthesis
   b. guard cell : regulation of transpiration
   c. sieve-tube member : translocation
   d. vessel element : water transport
   e. companion cell : formation of secondary xylem and phloem

6. Girdling of a tree by completely removing a ring of bark MOST DIRECTLY affects the process of:
   a. translocation
   b. transpiration
   c. photosynthesis
   d. apical dominance
   e. cellular respiration

7. Stomata open when the guard cells:
   a. lose turgor pressure
   b. accumulate potassium only
   c. lose water
   d. increase their turgor pressure only
   e. accumulate potassium and increase their turgor pressure

8. 1. Water diffuses into the sieve elements.

2. Leaf cells produce sugar by photosynthesis.
3. Solutes are actively transported into sieve elements.
4. Sugar is transported from cell to cell in the leaf.
5. Sugar moves down the stem.

Which of the following represents a correct ordering of the events above, which explains the mass flow of materials in the phloem?

a. 1 - 2 - 3 - 4 - 5
b. 2 - 1 - 4 - 3 - 5
c. 2 - 4 - 1 - 3 - 5
d. 2 - 4 - 3 - 1 - 5
e. 4 - 2 - 1 - 3 - 5

9. Each heartbeat is initially triggered by the:

a. lymph node
b. sinoatrial node
c. atrioventricular node
d. stretch receptors
e. semilunar valves

10. Tracheal systems for gas exchange are found in:

a. crustaceans
b. earthworms
c. insects
d. jellyfish
e. vertebrates

11. All of the following respiratory surfaces are associated with capillary beds EXCEPT the:

a. gills of fishes
b. alveoli of lungs
c. tracheae of insects
d. skin of earthworms
e. skin of frogs

12. Air flows continuously in one direction through the lungs of which animals?

a. frogs
b. birds
c. mammals
d. crocodiles
e. flying insects

13. The part of an antigen that is actually recognized by the antibody is:

a. a single key atom
b. an antigenic determinant
c. the entire coat of a virus or bacterium
d. the antigen-binding site
e. the whole antigen

14. Which of the following cell types is responsible for initiating secondary immune response?

a. memory cells
b. macrophages
c. stem cells
d. B cells
e. T cells

15. Which of the following are effector mechanisms of humoral immunity?

I. Activation of complement
II. Neutralization
III. Precipitation

a. I only
b. II only
c. I and II only
d. II and III only
e. I, II, and III

16. If the concentration of glucose in the blood flowing through the kidneys is within the normal range, then which of the following statements is correct?
a. The nephron pumps glucose into the collecting duct.
b. The Bowman's capsule secrets glucose back into the blood.
c. No glucose passes from the glomerulus into Bowman's capsule.
d. Most glucose within the nephron tubule is reabsorbed by the blood.
e. Most glucose that passes from blood into the nephron tubule remains in the urine and is subsequently excreted.

17. Metanephridia are excretory structures found in:
a. earthworms
b. flatworms
c. insects
d. jellyfish
e. vertebrates

18. The wall of the proximial convoluted tubule is:
a. impermeable to water, but actively transports sodium ions out of the tubule.
b. freely permeable to urea and reabsorbs glucose and amino acids.
c. impermeable to water and does not transport sodium.
d. freely permeable to water and actively transports sodium ions out of the tubule.
e. bathed in a solution of urea, which results in water loss from the tubule by osmosis.

19. Identify the correct sequence of structures through which glomerular filtrate passes on its journey through the nephron.
a. collecting duct, proximal tubule, distal tubule, Bowman's capsule, loop of Henle.
b. loop of Henle, proximal tubule, Bowman's tubule, distal tubule, collecting duct
c. Bowman's capsule, collecting duct, loop of Henle, proximal tubule, distal tubule
d. loop of henle, Bowman's capsule, distal tubule, proximal tubule, collecting duct
e. Bowman's capsule, proximal tubule, loop of Henle, distal tubule, collecting duct

20. Water moves from the systemic circulation into the interstitial fluid by:
a. hydrostatic pressure.
b. active transport.
c. passive transport.
d. osmosis.
e. facilitated diffusion.

21. The process of gas, nutrient, and waste exchange occurs between _____and cells.
a. arteries
b. arterioles.
c. capillaries.
d. venules.
e. veins.

22. Blood returning from the lungs to the heart enters the:
a. right ventricle.
b. right atrium.
c. left atrium.
d. left ventricle.
e. vena cava.

23. Which one of the following is mismatched?
a) Fish - heart pumps only deoxygenated blood;
b) Bird - four-chambered heart;
c) Earthworm - has the greatest number of pumping chambers;
d) Amphibian - heart with a single atrium and ventricle;
e) None of the above.

24. Taking the shortest route, a red blood cell in an artery of Karen's left leg will pass through how many capillary beds before it reaches the right atrium of her heart? a) 1; b) 2; c) 3; d) 4; e) 5.

25. Animals like the earthworm must live in moist soil. How is this related to their respiration? a) They respire through their moist skin; b) Their lungs function most efficiently in a moist habitat; c) Waterlogged soil is rich in oxygen; d) The soil must be moist to keep their invaginated respiratory surfaces moist.

For questions 26-28, match one of the following types of heart with each of the characteristics.
a) fish heart
b) amphibian heart
c) bird heart
d) typical reptile heart
e) earthworm heart

26. Heart that pumps only deoxygenated blood.

27. Four-chambered heart.

28. Most pumping chambers.

29. Which of the following transfusions is compatible?

	Donor	Recipient
a)	A+	B+
b)	A-	A+
c)	O+	O-
d)	AB+	O+

Match the following choices to questions 30- 32. Choices may be used once, more than once, or not at all.

a) Naturally acquired active immunity
b) Naturally acquired passive immunity
c) Artificially acquired active immunity
d) Artificially acquired passive immunity
e) Nonspecific resistance

30. Type of protection Hal wants after being bitten by a rattlesnake.

31. Type of protection Deswita has from here "flu shot."

32. Type of protection all of us have once we have had chicken pox.

34. A blue whale stranded on a beach will suffocate because:

a. it needs to breath water.
b. its evaginated gills will dry out.
c. it will not be able to contract its diaphragm.
d. it will get the bends.
e. it will not suffocate, but will die of starvation.

Short Answer. Give short, concise answers to the following questions. Detach these sheets and turn them in separately.

35. List three reasons why most land animals have evolved invaginated rather than evaginated respiratory systems. (6)

36. Indicate how a typical terrestrial plant is adapted to meet the four requirements of a respiratory system. (8)

37. Describe the tracheal system of an insect and identify two fundamental ways in which this invaginated system differs from that of land vertebrates. (3)

38. Does the umbilical artery carry large amounts of food and oxygen? Why or why not? (3)

39. Compare and contrast B and T cells. In which arm of the immune system does each function? Is there any crossover between the 2 types of cells? (6)

40. Which type of cells does the HIV virus attack? How does this create an immune deficiency? (5)

41. Answer either **A** or **B.** Only one answer will be graded so **clearly** mark which answer you wish me to grade! (5)

A. In terms of anatomical limitations, explain why the world will never be overrun by giant cockroaches or ants.

B. Why will fast-swimming fish (eg., the mackeral) suffocate if kept in a small aquarium?