BIOS 100 - Summer, 2004 **Name:**
Exam III - 21 July, 2004
Michael Muller, Instructor **TA:**

This exam consists of 44 questions over 6 pages. Please check to see that all the pages are present before you begin. Use a #2 pencil and bubble in all answers. Your score will be posted on the UIC Blackboard site as soon as they are in. Good Luck!

Use the key below to answer questions 1 to 4. Choose the best answer.

I. Bryophytes (mosses)
II. Pteridophyta (ferns)
III. Coniferophyta (Pines)
IV. Anthophyta (angiosperms, flowering plants)

1. This/these plants produce seeds:
   A. IV only **B. III & IV** C. II, III, IV D. I only

2. This/these plants have the sporophyte as the dominant stage in the life cycle:
   A. IV only B. III & IV **C. II, III, IV** D. I only

3. This/these plants possess vascular tissue:
   A. IV only B. III & IV **C. II, III, IV** D. I only

4. This/these plants possess free-living sporophytes and gametophytes in their life cycle:
   A. I only **B. II only** C. I, II D. I, II, III

5. A fruit is a mature:
   A. Anther **B. Ovary** C. Ovule D. Stigma E. Stigma

6. In a seed plant, the _____ is the female gametophyte:
   A. Egg sac B. Ovary **C. Ovule** D. Pollen E. None of the above
   The answer is technically A, but I also accepted C because the notes are not clear on this

7. Which of the following is NOT a characteristic of monocots?
   A. Floral parts in threes
   B. Fibrous root system
   C. Endodermis
   D. Vascular cambium
   E. All of the above are characteristics of monocots

8. The diagram to the right is of a:
   A. Monocot root
   B. Monocot stem
   C. Dicot root
   D. Herbaceous dicot stem
   E. Woody dicot stem

9. Which of the following structures in incorrectly matched with its function?
   A. Stigma - receptive site for pollen
   B. Ovule - matures to produce the seed
   C. Anther - production of pollen grains
   D. Petals - identification of the flower by animals (advertising)
   E. All of the above structures are matched with their function

10. Which of the following statements (A - D) about roots is FALSE? If statements A - D are true, then choose, E.
   A. The cortex is composed primarily of parenchyma cells utilized for storage
   B. The endodermis contains the Casparian strip, a band of waxy suberin which prevents apoplastic water flow
   C. The pericycle produces the secondary xylem and phloem in the root
   D. The apical meristem is responsible for primary growth in the root
   E. All of the above statements are TRUE

11. Which of the following statements (A - D) about plant anatomy is FALSE? If statements A - D are true, then choose E.
   A. A woody dicot possesses a vascular cambium, but an herbaceous dicot does not
   B. Monocot stems have scattered vascular bundles
   C. Both woody and herbaceous dicots produce bud meristems
   D. Both monocot and dicot roots possess an endodermis
   E. All of the above statements are TRUE

12. Which of the following is NOT a function of the root?
   A. Reproduction B. Storage
   C. Anchorage of the plant D. Water acquisition
   E. All of the above are functions of the root

13. In which of the following cell types MUST water cross the plasma membrane?
   A. Epidermis B. Cortex
   C. Pericycle D. Xylem
   E. None of the above

Use the key below to answer questions 14 & 15. Choose the best answer
   I. Parenchyma IV. Xylem
   II. Collenchyma V. Phloem
   III. Schlerenchyma

14. Which of the cell types are living at functional maturity?
   A. I & II B. I, II, III C. II, III, IV **D. I, II, V** E. I, II, III, V

15. Which of the following cell types has a role in physically supporting the plant?
   A. III only B. II, III C. I, II, III **D. II, III, IV** E. I, II, III, V

16. Which of the following statements about plant anatomy is TRUE?
    A. The sieve tube elements in the phloem lack a nucleus
    B. Xylem elements and fibers have very thick cell walls and are living at functional maturity
    C. The root cortex and phloem are composed primarily of parenchyma cells
    D. A woody dicot is supported mostly by the collenchyma found in the stem
    E. All of the above statements are FALSE.

17. Which of the following cell types is phagocytic and is involved in both recognizing foreign cells and communicating their identity to other cells in the immune system?
    A. Neutrophils B. Erythrocytes **C. Macrophages**
    D. T-cells E. None of the above

18. Which of the following statements (A - D) about blood vessels is FALSE? If statements A - D are all true, then choose E.
    A. Arteries are thick-walled blood vessels that are surrounded by a layer of smooth muscle
    B. Arteries in the pulmonary circuit carry oxygenated blood while arteries in the systemic circuit carry deoxygenated blood
    C. Veins are thin-walled blood vessels and contain valves to prevent blood backflow
    D. There are often precapillary sphincters which regulate blood flow into capillary beds
    E. All of the above statements (A - D) are TRUE

19. Which of the following correctly traces blood flow from the heart, to the lungs, back to the heart, and then to the body
    A. Vena cava - right ventricle - right atrium - pulmonary trunk - pulmonary arteries - lungs - pulmonary veins - left ventricle - left atrium - aorta
    B. Vena cava - right atrium - right ventricle - pulmonary trunk - pulmonary arteries - lungs - pulmonary veins - left atrium - left ventricle - aorta
    C. Vena cava - right ventricle - right atrium - pulmonary trunk - pulmonary veins - lungs - pulmonary arteries - left ventricle - left atrium - aorta
    D. Vena cava - right atrium - right ventricle - pulmonary trunk - pulmonary veins - lungs - pulmonary arteries - left atrium - left ventricle - aorta
    E. None of the above

20. Which chamber of the heart pumps oxygenated blood to the body?
    A. Right atrium B. Right ventricle C. Left atrium **D. Left ventricle**

21. These arteries feed oxygenated blood directly to the heart cells:
    A. Heart arteries B. Aortal branches C. Brachiocephalic
    D. Coronary arteries E. None of the above

22. Oxygenation of the blood take place in the capillaries surrounding the _____ of adults?
    A. trachea **B. alveoli**
    C. bronchial tubes D. larynx
    E. None of the above

23. In which blood vessel type is blood pressure the greatest?
A. Arteries B. Arterioles C. Capillaries D. Venules E. Veins

24. What is the structure which prevents food from going down the trachea?
A. The pharynx **B. The epiglottis** C. The semi-lunar valve
D. The bronchi E. None of the above

25. Which of the following is NOT a function of the circulatory system?
A. Respirations B. Immunity C. Thermoregulation
D. Cellular communication **E. All of the above are functions of the circulatory system**

26. When you inhale, your diaphragm is:
A. Contracting B. Relaxing C. Not enough information to tell

27. Where is the concentration of oxygen in the blood the greatest?
A. In the arteries B. In the interstitial fluid C. In the veins
D. In the right side of the heart E. None of the above
This is a terrible, terrible question. I threw it out and everyone got credit for it. Sorry about that.

28. How is most of the carbon dioxide transported to lungs?
A. Directly dissolved into the plasma B. Bound to the hemoglobin
C. Converted to bicarbonate (HCO_3^-) D. As carbonic acid
E. None of the above

29. Which of the following organs in the digestive system is not correctly matched with its function?
A. Mouth - chemical and mechanical digestion of food
B. Stomach - chemical and mechanical digestion of food; absorption of proteins
C. Small intestine - chemical digestion of food; absorption of nutrients
D. Large intestine - absorption of water; compaction of feces
E. All of the above structures are correctly matched with their function

30. Which of the following statements (A - D) about the mouth is FALSE? If statements A - D are true, then choose E.
A. Mammals have four distinctive tooth types, each which performs a different function in chewing
B. One of the primary functions of the mouth is to physically break down food into smaller pieces so that it will have a higher surface area and be more easily digested by enzymes
C. Saliva also contains lubricants which will lubricate the food for easier swallowing
D. Salivary amylase is secreted in the saliva which will start the digestion of proteins
E. All of the above statements are TRUE

31. Which organ of the digestive system has the greatest surface area?
A. Esophagus B. Stomach **C. Small intestine**
D. Large intestine E. None of the above

32. Which of the following substances emulsifies fats?
A. Lipase **B. Bile** C. Amylase D. Pepsinogen
E. None of the above

33. What is the primary function of the large intestine (colon)?
A. Digestion and absorption of fats
B. Secretion of bicarbonate to neutralize stomach acid
C. Absorption of water and minerals
D. Production of insulin
E. None of the above

34. Which of the following is NOT a function of the liver?
A. Detoxification of the blood B. Production of bile
C. Storage of glucose (as glycogen) D. Destruction of old erythrocytes
E. All of the above are functions of the liver

35. Which of the following statements (A - D) about the endocrine system is FALSE? If statements A - D are true, then select E.
A. Hormones are the primary molecules of communication found in the endocrine system
B. Most cells of the body are exposed to various hormones, however a response will be elicited only those cells with specific hormone-binding receptors
C. The endocrine system is used to communicate messages slowly
D. An agonist is a molecule that binds to a receptor, preventing the binding of another hormone but failing to trigger the multicellular response
E. All of the above statements are TRUE

36. When a cell produces a hormone, releases it into the blood system, and triggers a response in a cell far away, we say that this is a(n):
A. Autocrine action B. Paracrine action **C. Endocrine action**

37. Which of the following is NOT a part of the central nervous system
A. Cerebellum B. Pons C. Spinal Cord
D. Eyes E. All of the above are part of the central nervous system

38. Where is the center of conscious thought located?
A. Medulla oblongata B. Cerebellum **C. Cerebrum**
D. Pons E. Hypothalamus

39. Which of the below is involved with regulation of body temperature, blood chemistry, and pH?
A. Medulla oblongata B. Cerebellum C. Cerebrum
D. Pons **E. Hypothalamus**

40. Which lobe of the brain is involved in the reception and processing of visual stimuli?
A. Frontal lobe B. Parietal lobe C. Temporal lobe **D. Occipital lobe**

41. Which of the following statements (A - D) about myelinated neurons is FALSE? If statements A - D are true, then select E.
    A. Impulses travel much more rapidly down a myelinated neuron than down a unmyelinated neuron
    B. Myelin is an insulator
    C. A myelinated neuron will have several Schwann cells wrapped around the axon.
    D. The spaces between the myelin sheaths are known as the Nodes of Ranvier
    E. All of the above statements about myelinated neurons are TRUE.

42. Which of the following statements about a neuron is TRUE?
    A. A resting neuron has a net positive charge inside and a net negative charge on the outside
    B. When a neuron fires, K+ channels open up and the neuron becomes depolarized
    C. The potential difference across the plasma membrane is obtained through the actions of the Na+/K+ ATPase (the sodium/potassium pump)
    D. At the synapse, ions travel across the synaptic cleft and continue the impulse down the post-synaptic neuron
    E. All of the above are FALSE.

43. Which of the following statements (A - D) about synapses is FALSE? If statements A - D are true, choose E.
    A. A synapse is a junction between a nerve cell and another cell
    B. Neurotransmitters are released at a synapse
    C. Reuptake is the process through which the post-synaptic terminal transports neurotransmitter back to the presynaptic terminal
    D. At a synapse, an electrical signal is changed to a chemical signal
    E. All of the above statements are TRUE

44. Which of the following is NOT a function of the nervous system?
    A. Control conscious movement
    B. Receive sensory input from internal and external environments
    C. Integrate the input
    D. Respond to stimuli
    E. All of the above are functions of the nervous system

45. Which of the following statements (A - D) about the stomach is FALSE? If statements A - D are true, then choose E.
    A. The stomach secretes hydrochloric acid (HCl) to break down starches
    B. The stomach secretes mucus to protect the lining from being eaten away from acid
    C. Most peptic (stomach) ulcers are caused by the bacteria *Heliobacter pylori*
    D. The pyloric sphincter is a muscular ring which, when opened, allows some stomach contents into the small intestine
    E. All of the above statements are TRUE