

# READ THE DIRECTIONS

**BIOLOGY: A HUMAN APPROACH EXAMINATION II NAME \_\_\_\_\_**

**EBIO 1040, SECS. #0001 & #0002**

**2 April 2007**

**INSTRUCTIONS:** Use a **SOFT-LEAD** pencil (#1 or #2) for writing in and mark-sensing your name, CU I.D. number, lecture section 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, computers of any type 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.

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**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. Which structure is **improperly** paired with its respiratory function?
  - A. Pulmonary membrane – exchange of CO<sub>2</sub> and O<sub>2</sub> in the lungs.
  - B. Hemoglobin – transport of oxygen in the blood.
  - C. Respiratory control center – control of breathing rate.
  - D. Nasal passages – moistening, warming, and filtering the air entering the breathing apparatus.
  - E. Bronchial tubes – monitor blood CO<sub>2</sub> levels.
2. The diaphragm is an important \_\_\_\_\_ used in respiration. Upon contraction it serves to \_\_\_\_\_ the volume of the chest (thoracic) cavity.

A. Model: explain	D. Mechanism: reduce
B. Surface: facilitate gas exchange in	E. Muscle: increase
C. Tissue: eliminate	
3. Which is **not** a characteristic of the **pulmonary membrane**?

A. It is only 2 cell layers thick	D. It filters incoming air
B. It has a large surface area	E. It has a moist lining
C. It is vulnerable to microbial attack	

**KEEP YOUR ANSWERS AND ANSWER SHEET COVERED AT ALL TIMES.**

4. Which is the correct pathway for inspired air?
  - A. Glottis – pharynx – bronchi – alveoli – capillaries
  - B. Pharynx – trachea – bronchi – bronchioles – alveoli
  - C. Glottis – trachea – bronchioles - bronchi – alveoli
  - D. Pharynx – trachea – bronchioles – capillaries – alveoli
  - E. Trachea – glottis – bronchi – bronchioles – alveoli
  
5. Death rates are on the decrease (or at least not increasing) in all of the following cancers **except**:
 

A. Colon cancer	D. Lung cancer
B. Breast cancer	E. Stomach cancer
C. Prostate cancer	
  
6. Concerning respiration, which of the following statements is **false**?
  - A. Hemoglobin has its greatest affinity for oxygen when passing through areas of the body which are low in oxygen concentration.
  - B. The respiratory control center is in the medulla of the brain.
  - C. Hemoglobin has a greater affinity for carbon monoxide than for oxygen.
  - D. The nasopharynx is an important part of the respiratory system because it moistens, warms and filters incoming air.
  - E. Smoking is strongly associated with emphysema, a condition involving the destruction of the pulmonary membrane.
  
7. Which of the following is **false** concerning lung cancer?
  - A. Lung cancer is the #1 cancer killer in the US today.
  - B. One diagnosed with lung cancer will not likely live more than five years.
  - C. Presently there is a percentage increase in lung cancer occurring in men in the US today.
  - D. Lung cancer is very difficult to diagnose and once diagnosed is very difficult to cure.
  - E. Cigarette smoking contributes to lung cancer.
  
8. Which of the following would **not** directly affect alveolar ventilation (*i.e.*, the total breathing effort)?
  - A. The accumulation of water in the lungs
  - B. A slightly increased blood osmotic pressure
  - C. The degeneration of alveolar membranes
  - D. The suppression of the medulla area of the brainstem (*i.e.*, the respiratory control center)
  - E. An increase in carbon dioxide levels in the blood
  
9. The affinity of hemoglobin for carbon monoxide (CO) is \_\_\_\_\_ greater than its affinity for oxygen (O<sub>2</sub>).
 

A. 1 ½ times	B. 2 times	C. 5 times	D. 50 times	E. 200 times
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10. Which of the following statements is **false**?
  - A. Altitude sickness is not life threatening.
  - B. The altitude limit for breathing air is about 18,000 feet.
  - C. The altitude limit for breathing oxygen is about 45,000 feet.
  - D. High altitude acclimatization significantly increases one's cardiac output.
  - E. Pulmonary edema can be life threatening.

11. Acclimatization to high altitudes includes all of the following **except**:
- A. Increasing white blood cell production
  - B. Increasing circulatory efficiency
  - C. Increasing red blood cell production
  - D. Lowering CO<sub>2</sub> tolerance
  - E. Increasing tissue vascularization
12. Peruvian Indians live at altitudes up to 15,000 feet above sea level. They work, play vigorous soccer and seem very healthy. We would expect them to have, relative to our own bodies, all of the following **except**:
- A. A greater number of red blood cells
  - B. A more stressed heart
  - C. A faster respiratory rate
  - D. Greater tissue vascularization
  - E. A greater hematocrit
13. A lack of oxygen in the brain produces symptoms characteristic of:
- A. Altitude sickness
  - B. Drunkenness
  - C. Hypothermia
  - D. All of the above
  - E. A and B only are true
14. A person exhibiting increased cardiac output, fluid loss from his/her circulatory system, an increased hematocrit and a slightly increased respiratory rate would most likely be suffering from:
- A. Emphysema
  - B. Heat stroke
  - C. Sever internal bleeding
  - D. Hypothermia
  - E. Sudden exposure to high altitude
15. Which of the following is **not** a characteristic of a diving mammal?
- A. Relatively high blood volume
  - B. Increased oxygen-carrying capacity of blood
  - C. Slowed metabolic rate when diving
  - D. Ability to absorb oxygen through the skin
  - E. Ability for typical body cells to burn glucose without oxygen
16. Which of the following is **false**?
- A. The oxygen consumption of the viscera and muscles of diving mammals is reduced during a dive.
  - B. A diving mammal's blood has a greater concentration of hemoglobin than a non-diving mammal's.
  - C. The body temperature of a diving mammal during a dive remains constant.
  - D. Depriving the brain of oxygen for 4-6 minutes usually results in irreversible brain damage.
  - E. Artificial respiration should be administered to a cold-water drowning victim even though s/he was submerged for 15 minutes.
17. Which of the following statements about the **reflex arc** is **false**?
- A. Impulses are carried to the effector *via* motor neurons.
  - B. Impulses are carried to the spinal cord or brain by sensory neurons.
  - C. Incoming impulses are usually processed in the hypothalamus.
  - D. An inter neuron links incoming and outgoing impulses.
  - E. Impulse information is integrated in the brain or spinal cord.

18. **Motor** neurons transmit impulses from:
- The central nervous system to sensory receptors.
  - The central nervous system to effectors
  - The endocrine system to sensory receptors.
  - Sensory receptors to the central nervous system.
  - None of the above.
19. Which of the following is **not** true about neurotransmitters?
- They can stimulate impulses by changing membrane permeability to Na<sup>+</sup> (sodium ions).
  - They can excite or inhibit impulse production.
  - They are most often released from the cell body of the neuron.
  - They diffuse across the synapse.
  - They are broken down by enzymes.
20. An electro-chemical wave passing along a nerve cell is called:
- A reflex
  - A stimulus
  - A response
  - An impulse
  - A synapse
21. What structure is the arrow pointing at?
- Axon
  - Schwann cell
  - Dendrite
  - Synaptic bulb
  - Cell body
22. Which of the following statements is/are **true**?
- The parasympathetic nervous system uses epinephrine as a neurotransmitter.
  - The sympathetic nervous system uses epinephrine as a neurotransmitter
  - Both parasympathetic and sympathetic systems use AC (acetylcholine) as a neurotransmitter.
  - AC from the parasympathetic nervous system travels through the blood to a wide range of target organs.
  - More than one of the above is true.
23. Body areas which would be **inhibited** by the **parasympathetic** N.S. stimulation would include:
- Digestive system, skin circulation, kidneys
  - Skin circulation, kidneys, heart pacemaker.
  - Heart pacemaker, eye iris, skeletal muscles
  - Skeletal muscles, eye iris, digestive system
  - Both C and D are correct responses.
24. Acetylcholine (AC):
- Is produced and released by the adrenal medulla gland.
  - Is another name for adrenaline
  - Increases the permeability of some neuronal cell membranes to sodium ions.
  - Always has an excitatory effect.
  - None of the above.

25. Which is **false**?
- Our **synapses** constitute the “weakest link” in the nervous system.
  - Two common neurotransmitters are epinephrine and acetylcholine esterase (AC-ase).
  - Information can go across a synapse in only one direction.
  - A drug blocking acetylcholine (AC) would be an effective depressant or general anesthetic.
  - Nerve gases act by blocking acetylcholine esterase (AS-ase).
26. Which of the following does **not** describe “**hormones**”?
- Chemical substances
  - Helps maintain body homeostasis
  - Transported by the circulatory system
  - Produced in large quantities
  - Produced in one part of the body, has an effect on a different part (*i.e.*, its target organ)
27. Which of the following is **true**?
- A human with a badly damaged cerebrum would not be able to maintain his/her vital bodily functions such as respiration and circulation.
  - The hypothalamus is directly involved with respiratory control.
  - The medulla controls the body’s osmotic pressure.
  - Perception occurs primarily in the pituitary gland.
  - An athlete relies on his/her cerebellum for muscular coordination.
28. Neurosecretory cells which govern or control endocrine secretions of the anterior pituitary are found in the:
- Cerebral cortex
  - Adrenal cortex
  - Medulla
  - Posterior pituitary
  - Hypothalamus
29. The hypothalamus:
- Is located in the midbrain above the thalamus
  - Is the part of the brain involved with emotional behavior
  - Is the direct extension of the spinal cord
  - Is the center for the interpretation of sensory information
  - Houses the respiratory control center
30. The **cerebrum** and **cerebellum** are concerned **respectively** with:
- Reflex and conscious activities
  - Thinking and control of respiration
  - Conscious activities and muscular coordination
  - Muscular coordination and control of the heart beat
  - None of the above
31. In this diagram of a repetitive circuit, which impulse would arrive at the final neuron **first**?

32. What area of the human brain is primarily involved in learning?  
 A. Medulla  
 B. Midbrain  
 C. Cerebrum  
 D. Thalamus  
 E. Cerebellum
33. The largest, most conspicuous part of the mammalian brain is the:  
 A. Olfactory lobe  
 B. Medulla  
 C. Cerebrum  
 D. Cerebellum  
 E. Optic lobe
34. Which of the following represents incoming sensory information headed to the higher brain centers?  
 A. The cerebral cortex  
 B. The reticular formation  
 C. The pons and the medulla  
 D. The cerebellum  
 E. The hypothalamus
35. Which of the following does **not** logically fit with the others?  
 A. Reticular formation  
 B. Corpus callosum  
 C. Window of consciousness  
 D. Serotonin  
 E. Thalamus
36. Alcohol affects the brain differentially. Which of the following represents the proper sequence of brain malfunctions due to the presence of alcohol?  
 A. Heart rate, walking, speaking  
 B. Typing, vision, breathing  
 C. Vision, walking, breathing  
 D. Walking, speaking, heart rate  
 E. Speaking, heart rate, typing
37. All of the following would represent a brain disorder **except**:  
 A. Aneurism  
 B. Stupor  
 C. Stroke  
 D. Seizure  
 E. Tic
38. Which of the following organisms is/are quite sensitive to chemicals in the environment?  
 A. Gypsy moths  
 B. Rattlesnakes  
 C. Bees  
 D. Bloodhounds  
 E. More than one of the above
39. All of the following are true about receptors **except**:  
 A. Initiate nervous impulses  
 B. Are transducers  
 C. Most have a threshold  
 D. Measure stimulus intensity  
 E. Always fire at the same frequency
40. If one's optic and auditory nerves were crossed:  
 A. The light receptors in the retina would cease to function.  
 B. The sound receptors in the ear would cease to function.  
 C. One might "hear" lightening and "see" thunder  
 D. One would have no perception of light or sound.  
 E. The rods of the retina would detect colors.