READ THE DIRECTIONS

BIOLOGY: A HUMAN APPROACH EXAMINATION I
NAME_____

EBIO 1040, SECS. #0001 & #0002
February 14, 2011

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)**, 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!

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, Blackberrys, computers, calculators or mobile devices of any kind during this 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 9:30 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.

1. Which of the following would **not** apply to a snake?
   A. It would be more metabolically active than a dog.
   B. It has a body temperature that changes throughout the day.
   C. It can somewhat control its body temperature with behavioral adaptations.
   D. It feeds less than a comparably-sized bird.
   E. It is an ectotherm.

2. Endotherms with a **higher** surface/volume ratio generally display a relatively:
   A. Higher metabolic rate and smaller size
   B. Higher metabolic rate and larger size
   C. Lower metabolic rate and smaller size
   D. Lower metabolic rate and larger size

E. None of the above

3. All of the following apply to **homeostasis** except:
   A. Maintenance of physiological stability
   B. Relatively constant internal conditions
   C. Positive feedback control
   D. Highly regulated in endotherms
   E. Stability of internal fluids

4. How does the surface/volume of the mother with a 9-inch long forelimb compare with that of her newborn kit fox with a 1/2-inch forelimb?
   A. 3 x greater B. 6 x greater C. 36 x greater D. 6 x less E. 36 x less

5. An endotherm with a **high** surface/volume ratio would generally fit all of the following characteristics **except**:
   A. Be better adapted to live in a warm climate
   B. Likely be small
   C. Have a high metabolic rate
   D. Have a short lifespan
   E. Use a thick layer of blubber for insulation

6. What is the primary method of temperature control used by ectothermic animals?
   A. Subcutaneous circulation
   B. Monitoring of the blood by the hypothalamus
   C. Behavioral mechanisms
   D. Evaporative cooling processes
   E. Maintenance of a high metabolic rate

7. Which of the following would be representative of a person experiencing a fever?

8. Which adaptation would **not** be beneficial to an **arctic** mammal?
   A. A low surface/volume ratio
   B. Small size
   C. Short appendages
   D. Fat insulation
   E. Countercurrent heat exchange in the extremities

9. The hormone thyroxin affects temperature regulation by:
   A. Increasing metabolism
   B. Increasing subcutaneous circulation
   C. Lowering the set point of the thermostat
   D. Decreasing subcutaneous circulation
   E. Raising the set point of the thermostat

10. Why does a hat on one's head keep one's feet warm?
   A. The body thermostat is located in the head region.
   B. The head region loses heat because of its many superficial blood vessels, thus "robbing' the extremities (hands and feet) of heat.

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C. A warm head slows the flow of blood to the head, allowing more blood to go to the feet.
D. This belief from the past is **not** true.
E. A warm cerebrum turns on the thermostat for the lower body regions.

11. **All** of the following thermoregulatory adaptations would help a whale living in the Arctic **except:**
    A. A thick subcutaneous fat layer
    B. Few extremities
    C. Small surface/volume ration
    D. Extensive subcutaneous circulation
    E. Countercurrent heat exchange in its flippers

12. Which of the following is **not** an adaptation for conserving body heat?
    A. Feathers/down on some endotherms
    B. Countercurrent heat exchange in penguins and ducks
    C. Fur on some endotherms
    D. Perspiration released by sweat glands
    E. Blubber or fat in some birds and mammals

13. Heat exhaustion is caused by:
    A. Lowering of the body core temperature
    B. An abnormal body thermostat
    C. Elevation of the body temperature
    D. Exposure
    E. Improper balance of body salts/fluids

14. Heat stroke may be life-threatening because:
    A. Core body temperature increases.
    B. Water/salt is unbalanced.
    C. Heart rate decreases.
    D. Perspiration is excessive
    E. The body temperature is reset downward

15. Fevers occur when:
    A. Bacteria infects the hypothalamus.
    B. The hypothalamus increases the heartbeat.
    C. One fails to keep the body core warm.
    D. The body detects an infection and increases the thermostat's set point in an attempt to combat the infection.
    E. B and D are **both** true.

16. Why does one sometimes think he/she is cold when there is a fever?
    A. The body core is warm but the extremities are cold.
    B. The thermostat's set point has been lowered.
    C. The fever has "broken" and one is trying to cool down.
    D. The body temperature is below the thermostat's elevated set point.
    E. The thermostat has temporarily lost control of the body temperature.

17. Which of the following is **false**?
    A. In the film "Survival," not all the actors were professional actors.
    B. A dog is more likely to survive cold stress than a person.
    C. None of the animals/organisms in the Arctic freeze solid; they survive unfrozen under the thick snow/ice cover.
    D. At least one human embryo has survived being frozen solid.

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E. Mammalian sperm has been routinely frozen since the 1950s.

18. Which of the following is **not** a characteristic of heat stroke?
    A. Number one cause of death among marathon runners.
    B. Very high body temperature
    C. A salt and/or water imbalance
    D. Lack of, or reduced perspiration
    E. Mental incoherence

19. The major problem today with human cryogenic storage or cryoburials is:
    A. Tissue damage during the thawing process
    B. Heart damage during the freezing process
    C. Irreversible damage to the hypothalamus
    D. Irreversible damage to the higher brain centers
    E. “Freezer burn” on the extremities

20. When an animal hibernates in winter, which of the following statements is **false**?
    A. Heart rate decreases.
    B. Respiration decreases.
    C. Basal metabolism decreases.
    D. Body temperature is controlled by the environment.
    E. Stored fat provides energy for metabolism.

21. Which is **false** about a hibernating animal?
    A. The heart rate, respiration rate and metabolism are drastically reduced.
    B. If the chamber temperature drops below freezing, the animal is likely to die.
    C. The thermostat set point is adjusted to the temperature of the chamber, but above freezing.
    D. Stored fat provides the energy for survival.
    E. The animal awakens at regular intervals during hibernation.

22. Which of the following is a physiological mechanism for **cooling down**?
    A. Moving blood to deep tissue capillaries
    B. Shivering
    C. Secretion of thyroid hormone (thyroxin) flow from the thyroid gland
    D. Release of epinephrine (adrenaline) by the adrenal glands
    E. None of the above

23. Which of the following is **not** a symptom of hypothermia?
    A. Shivering at first
    B. Feeling cold at first
    C. Reddened skin surface
    D. Loss of coordination
    E. Disorientation

24. Which statement is **false**?
    A. Many people who were listed as “drowned” during the early part of the last century actually died of hypothermia.
    B. Cold water draws heat away from an object 25 times faster than air will at the same temperature.
    C. Hypothermia is the largest cause of death of active “outdoors people” today.
    D. Persons suffering from **severe** hypothermia can warm themselves by building a fire and drying their wet clothing.

E. Awareness about the dangers of hypothermia is saving many lives today.

25. Which of the following play(s) a role in the clotting mechanism?
    A. Hypothalamus
    B. Platelets
    C. Abrasive inner surface of injured blood vessels
    D. **All** of the above
    E. Only B and C

26. Platelets:
    A. Contain a clotting enzyme
    B. If in excess can cause leukemia
    C. Release a vasoconstrictor when damaged
    D. Are larger than red blood cells
    E. More than one of the above

27. The **hematrocrit** is defined as the:
    A. Plasma portion of the blood
    B. Plasma portion minus the cellular portion of the blood
    C. Number of red blood cells in a milliliter of blood
    D. Total number of all cells in a milliliter of blood
    E. Percent of the cellular component of the blood

28. The blood vessel or heart chamber with the **highest** oxygen concentration in an adult human is the:
    A. Jugular neck vein
    B. Pulmonary artery
    C. Pulmonary vein
    D. Right ventricle
    E. Right atrium

29. Which vessel listed below has the highest blood pressure?
    A. Coronary vein
    B. Renal (kidney) artery
    C. Hepatic portal (liver) vein
    D. Any capillary
    E. Pulmonary vein

30. Which statement concerning the cardiovascular system is **false**?
    A. The arteriole is the last branch before reaching the capillaries.
    B. The diameter of the arteriole can change drastically.
    C. The medulla of the brain can influence blood flow.
    D. The heartbeat originates in the medulla/oblongata.
    E. Coronary arteries branch off the aorta and supply the heart itself with blood.

31. Regarding the circulatory system, which of the following is **false**?
    A. Some veins carry oxygenated blood.
    B. Valves in the arteries keep blood flowing in the proper direction.
    C. Movement of the body organs and muscles is helpful in returning blood to the heart through the veins.
    D. Blood velocity in the capillaries is much less than blood velocity in the veins and arteries.
    E. There is not enough blood in the body to fill all the blood vessels at the same time.

32. **Elephantiasis** is a condition directly affecting the:
    A. Lymph nodes
    B. Lymph valves
    D. Lymph capillaries
    E. More than one of the above

C. Lymph veins

33. Which is **not** true about the lymphatic system?
    A. The vessels are thin walled like veins.
    B. There is no pump.
    C. The flow of lymph is about as fast as in the veins.
    D. Lymph originates by fluid leaking out of the capillaries.
    E. It empties into the large veins near the heart.

34. Fluid flow in the body is aided and directed by valves located in:
    A. Veins B. Arteries C. Lymph vessels D. Arterioles E. More than one of the above

35. High blood pressure is associated with all of the following **except**:
    A. Decreased risks of edema
    B. Increased risk of blood clotting
    C. Increased risk of atherosclerosis
    D. Increased risk of aneurysms
    E. 20% of 60-yr olds in the US

36. Adjustments in the body's general distribution of blood flow are accomplished by:
    A. Bulk flow through the capillaries
    B. The cardiovascular control center and arterioles
    C. The medulla and venous return
    D. Countercurrent exchange
    E. The pulmonary circulation

37. Which of the following would **not** be a stroke symptom?
    A. Difficulty in saying some word combinations
    B. Difficulty with balance in climbing stairs
    C. Difficulty in stopping the bleeding in a scalp wound
    D. Loss of feeling in the right hand
    E. Loss of ability to move two fingers

38. A "lub-dub-swish" heart sound indicates a problem with the:
    A. Pacemaker
    B. Coronary arteries
    C. Valves between the atria and ventricles
    D. Valves as the blood leaves the ventricles
    E. Pulmonary aorta

39. Where does the heartbeat **originate**?
    A. The medulla oblongata
    B. The heart muscle itself
    C. The hypothalamus of the brain
    D. Cardiovascular control center
    E. More than one of the above is correct

40. Heart murmurs are caused by:
    A. Incomplete closure of heart valves
    B. Poor pulmonary circulation
    D. Faulty coronary artery circulation
    E. Pacemaker malfunction

C. Atherosclerosis