

Standard 3 Objective 2 Describe the relationship between structure and function of organ systems in plants and animals

40 Question(s)
Test ID: 2142483952

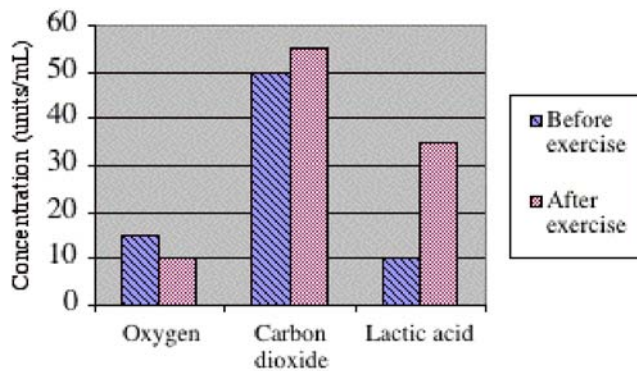
Name: _____

Date: _____

- 1) Bulimia is an eating disorder characterized by binge eating followed by purging. Bulimics sometimes believe that purging prevents the body from absorbing calories. Many bulimics use laxatives to purge. Laxatives alleviate constipation by preventing the body from absorbing water from the digestive material. Are laxatives effective in preventing calories from being absorbed from food?
 - A. Yes, because the laxatives prevent water and calories from being absorbed in the stomach
 - B. Yes, because laxatives speed up the entire digestive process and cause the person to expel stool very quickly
 - C. No, because the large intestine absorbs all the calories
 - D. No, because absorption of calories occurs in the small intestine and laxatives prevent water from being absorbed in the large intestine
- 2) Howard is famous for his amazing pancakes. One day, while flipping his pancakes, he burned his finger on the pan and sensed pain. How is the nervous system involved in Howard's sensation of pain?
 - A. Receptors on the skin release chemicals that cause the pain sensation
 - B. The pain is caused because a blister forms on the skin
 - C. A nerve impulse travels from the sensory neuron to the brain and causes Howard to feel pain
 - D. The motor neuron is stimulated and causes Howard to quickly jerk his hand away
- 3) Materials for growth of a dog results from which group of life activities?
 - A. assimilation, sensitivity, excretion, locomotion
 - B. food getting, digestion, absorption, assimilation
 - C. locomotion, assimilation, excretion, reproduction
 - D. reproduction, respiration, excretion, secretion
- 4) Edward Jenner observed that people who had contacted cowpox did not develop smallpox. He inoculated a boy with cowpox and later exposed this boy to smallpox. The boy did not contract smallpox. What hypothesis did Jenner make?
 - A. If exposed to cowpox, a person would also be immune to smallpox
 - B. If exposed to smallpox, a person would also be immune to cowpox
 - C. If T-lymphocytes were not yet differentiated, smallpox would still develop
 - D. Cowpox and smallpox are the same disease
- 5) How would a change in altitude, such as climbing to the top of Mount Timpanogos, affect a person's breathing rate?
 - A. The rate would be decreased because of more carbon dioxide
 - B. The rate would be increased because of less atmospheric pressure
 - C. The rate would be unchanged because the factors that would cause an increase are balanced by factors causing a decrease
 - D. The rate would be increased because of lower blood carbon dioxide levels
 - E. The rate would be decreased because of high blood oxygen levels
- 6) How are valves in the circulatory system similar to sphincters in the digestive system?
 - A. Both limit movement of substances through the system
 - B. Both absorb excess fluid from the system
 - C. Both add strength to the walls of the system
 - D. Both actively push substances through the system
 - E. Both control an exit to the system
- 7) Complex materials in food are changed in to simpler nutrients in a process called
 - A. digestion
 - B. excretion
 - C. nutrition
 - D. secretion

- 8) An investigation was carried out to determine what factors cause an increase in the rate of breathing during exercise. Samples of blood oxygen, blood carbon dioxide, and blood lactic acid concentrations were collected from Alex before and after a period of exercise. The information is presented in the graph below. Alex's breathing rate before and after exercise was also measured. It increased from 12 breaths per minute before exercise to 27 breaths per minute after exercise.

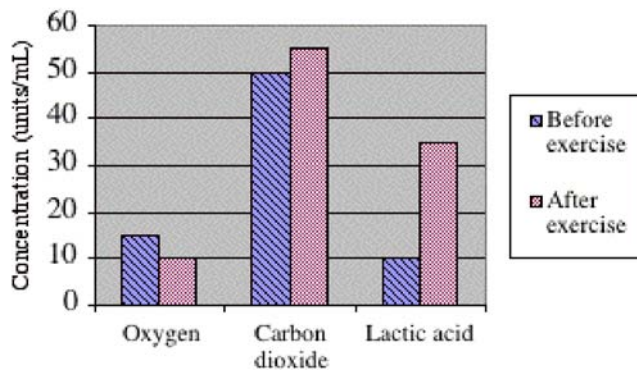
Analysis of Arterial Blood Before and After Exercise



What is the difference between carbon dioxide concentrations before and after exercise?

- A. The concentration of carbon dioxide increased by 25
 - B. The concentration of carbon dioxide increased by 10
 - C. The concentration of carbon dioxide increased by .5
 - D. The concentration of carbon dioxide remained the same
 - E. The concentration of carbon dioxide decreased after exercise
- 9) An investigation was carried out to determine what factors cause an increase in the rate of breathing during exercise. Samples of blood oxygen, blood carbon dioxide, and blood lactic acid concentrations were collected from Alex before and after a period of exercise. The information is presented in the graph below. Alex's breathing rate before and after exercise was also measured. It increased from 12 breaths per minute before exercise to 27 breaths per minute after exercise.

Analysis of Arterial Blood Before and After Exercise

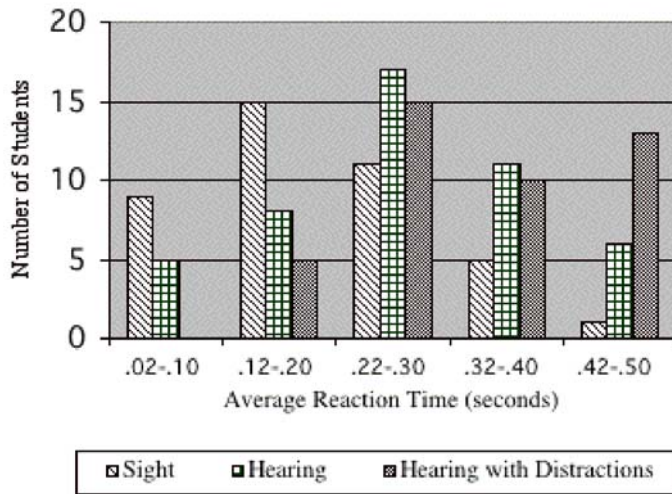


What is the arterial blood concentration of oxygen (in units/mL) in Alex's body before exercise?

- A. 10
- B. 11
- C. 15
- D. 20
- E. 50

- 10) Below is a graph that represents the reaction times of a group of students catching meter sticks. One student dropped the meter stick, while the other student caught the stick under different situations. The first reaction time measured was when the student saw his classmate drop the stick. During the second test, the student had his eyes closed and caught the stick upon a verbal cue from his partner. During the third test, the student had his eyes open but the radio was playing loud music. From this graph, answer the following questions.

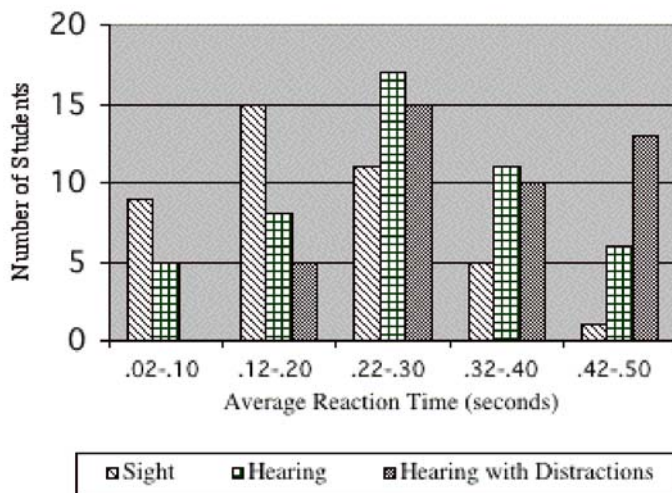
Student Reaction Times



Which system is primarily responsible for reaction time?

- A. Nervous system
 - B. Sense system
 - C. Muscular system
 - D. Skeletal system
- 11) Below is a graph that represents the reaction times of a group of students catching meter sticks. One student dropped the meter stick, while the other student caught the stick under different situations. The first reaction time measured was when the student saw his classmate drop the stick. During the second test, the student had his eyes closed and caught the stick upon a verbal cue from his partner. During the third test, the student had his eyes open but the radio was playing loud music. From this graph, answer the following questions.

Student Reaction Times

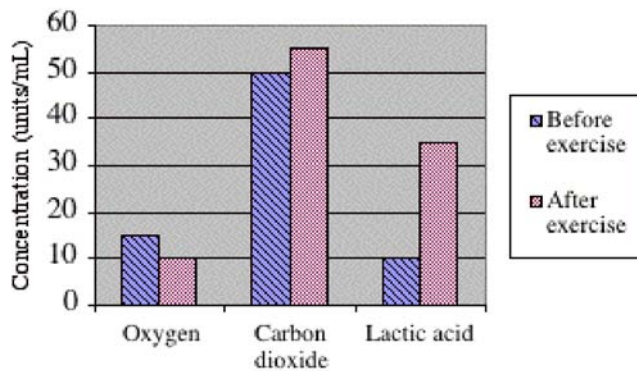


What variable accounts for the fastest reaction time?

- A. Sight
- B. Hearing
- C. Hearing with distractions
- D. Touch

- 12) An investigation was carried out to determine what factors cause an increase in the rate of breathing during exercise. Samples of blood oxygen, blood carbon dioxide, and blood lactic acid concentrations were collected from Alex before and after a period of exercise. The information is presented in the graph below. Alex's breathing rate before and after exercise was also measured. It increased from 12 breaths per minute before exercise to 27 breaths per minute after exercise.

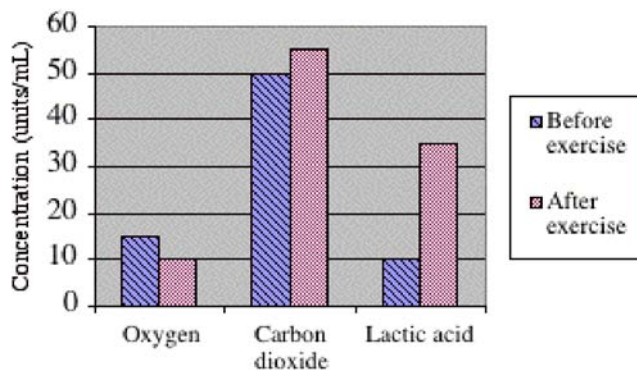
Analysis of Arterial Blood Before and After Exercise



By analyzing the data presented, what inference could be made about why the breathing rate more than doubled after a period of exercise?

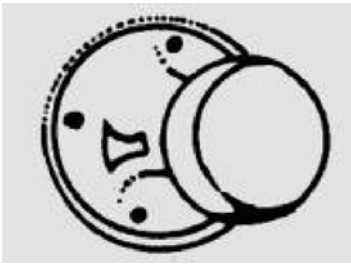
- A. The breathing rate increased to get rid of the carbon dioxide accumulated during exercise
 - B. The breathing rate increased to make up for the oxygen lost during exercise
 - C. The breathing rate increased because Alex was out of shape
 - D. The breathing rate increased to supply oxygen to burn the lactic acid accumulated during exercise
 - E. The breathing rate increased to exchange oxygen for the carbon dioxide accumulated during exercise
- 13) An investigation was carried out to determine what factors cause an increase in the rate of breathing during exercise. Samples of blood oxygen, blood carbon dioxide, and blood lactic acid concentrations were collected from Alex before and after a period of exercise. The information is presented in the graph below. Alex's breathing rate before and after exercise was also measured. It increased from 12 breaths per minute before exercise to 27 breaths per minute after exercise.

Analysis of Arterial Blood Before and After Exercise



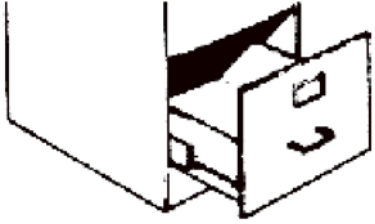
What relationship exists between lactic acid and exercise?

- A. The concentration of lactic acid increased after exercise because carbon dioxide increased
 - B. The concentration of lactic acid increased after exercise because the kidneys could not excrete it fast enough
 - C. The concentration of lactic acid increased after exercise because cells went into oxygen debt
 - D. The concentration of lactic acid increased after exercise because the rate of respiration decreased
 - E. The concentration of lactic acid increased after exercise because the lungs could not exhale carbon dioxide fast enough
- 14) Which joint in the human body has movement similar to the movement of the object shown in the diagram?



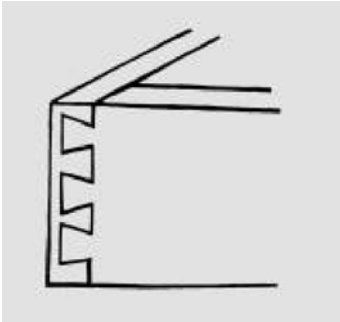
- A. elbow
- B. cranium
- C. knee
- D. neck
- E. jaw

15) Which joint in the human body has movement similar to the movement of the object shown in the diagram?



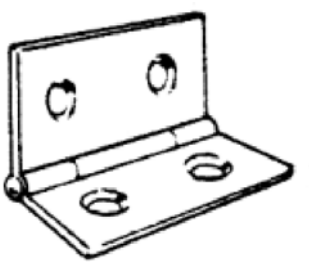
- A. shoulder
- B. elbow
- C. wrist
- D. knee
- E. cranium

16) Which joint in the human body has movement similar to the movement of the object shown in the diagram?



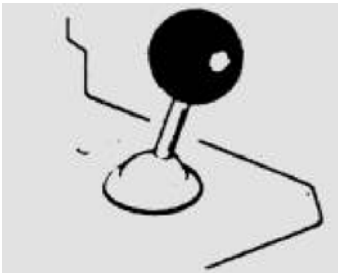
- A. knee
- B. shoulder
- C. ankle
- D. elbow
- E. cranium

17) Which joint in the human body has movement similar to the movement of the object shown in the diagram?



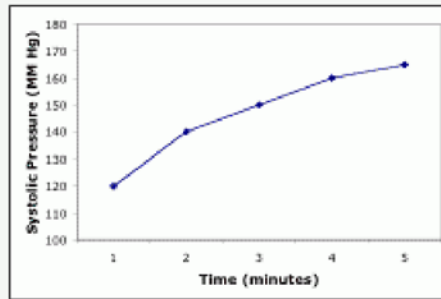
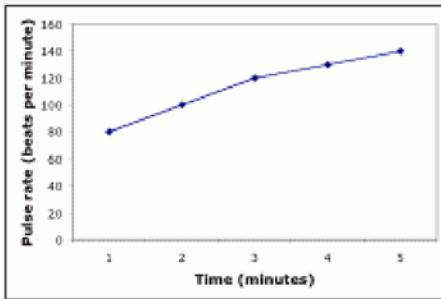
- A. elbow
- B. shoulder
- C. neck
- D. hip
- E. wrist

18) Which joint in the human body has movement similar to the movement of the object shown in the diagram?



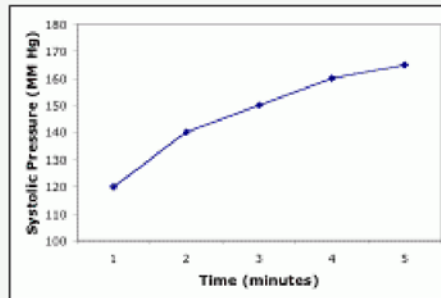
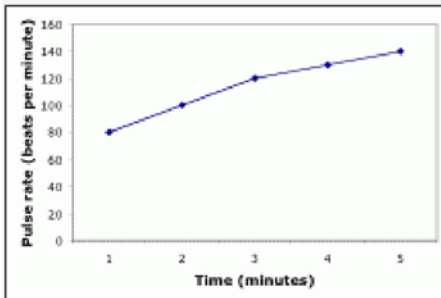
- A. wrist
- B. hip
- C. knee
- D. cranium
- E. jaw

19) Susan's assignment is to examine the effects of exercise on pulse rate and blood pressure. She started with a sitting pulse rate and blood pressure and continued to record data as she exercised for 5 minutes. She recorded the following:



Susan concludes that exercise causes an increase in pulse rate and increased pulse rate causes a rise in blood pressure. How would you evaluate her conclusion?

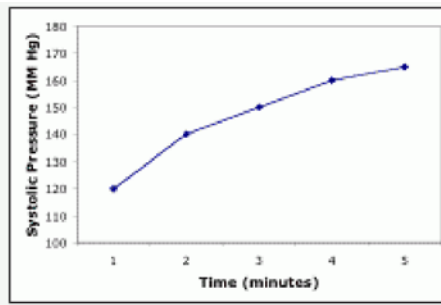
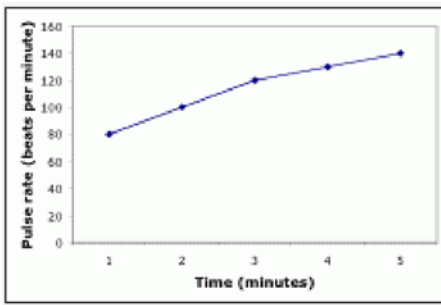
- A. A good conclusion; it is supported by her data
 - B. A good conclusion; the graphs prove it is true
 - C. A poor conclusion; it is not entirely supported by her data
 - D. A poor conclusion; it is completely unsupported
- 20) Susan's assignment is to examine the effects of exercise on pulse rate and blood pressure. She started with a sitting pulse rate and blood pressure and continued to record data as she exercised for 5 minutes. She recorded the following:



How would these data change if Susan now sat down for 5 minutes and then measured pulse rate and blood pressure?

- A. Blood pressure and pulse rate would both decrease
- B. Blood pressure would decrease while pulse rate would stay the same
- C. Pulse rate would decrease while blood pressure would stay the same
- D. Both blood pressure and pulse rate would stay the same as after 5 minutes of exercise

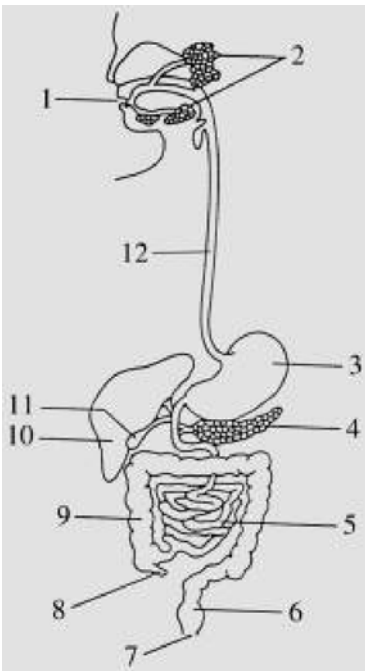
21) Susan's assignment is to examine the effects of exercise on pulse rate and blood pressure. She started with a sitting pulse rate and blood pressure and continued to record data as she exercised for 5 minutes. She recorded the following:



What do these data indicate?

- A. Exercise does not affect pulse rate or blood pressure
- B. Pulse rate increases with exercise, but blood pressure does not
- C. Blood pressure increases with exercise, but pulse rate does not
- D. Both blood pressure and pulse rate increase with exercise

22) Which structures does food pass through, and in what order, starting with the mouth?



- A. 1, 2, 12, 3, 5, 9, 7
- B. 1, 12, 3, 4, 9, 6, 7
- C. 1, 12, 3, 5, 9, 6, 7
- D. 1, 2, 12, 5, 9, 8, 7
- E. 1, 12, 3, 11, 9, 8, 7

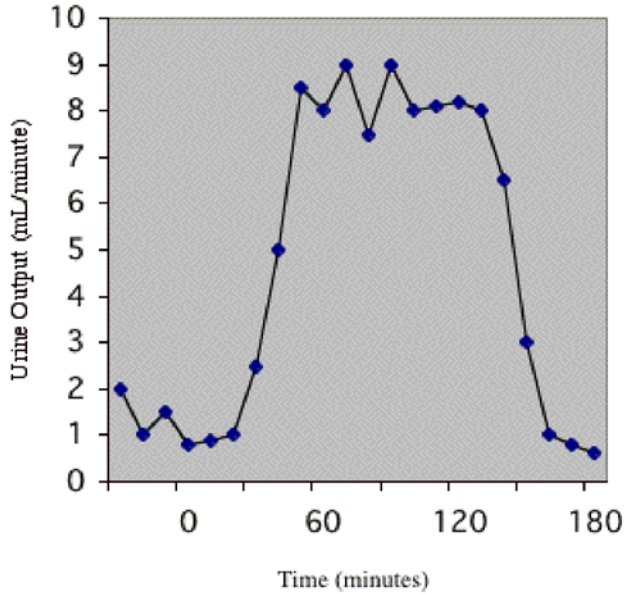
23) Which of the following best explains the difference in protein concentrations from blood to urine?

Comparison of Materials in Blood and Urine		
	% in Blood	% in Urine
Water	92.0	96.0
Protein	7.0	0.0
Glucose	0.1	0.0
Sodium	0.33	0.25
Potassium	0.02	0.24
Urea	0.03	2.90

- A. The body has enough protein, therefore it is excreted as waste
- B. Protein is needed in the body, therefore it is not excreted
- C. The percent of protein in the blood and urine is the same
- D. The body controls the amount of protein and potassium by similar processes

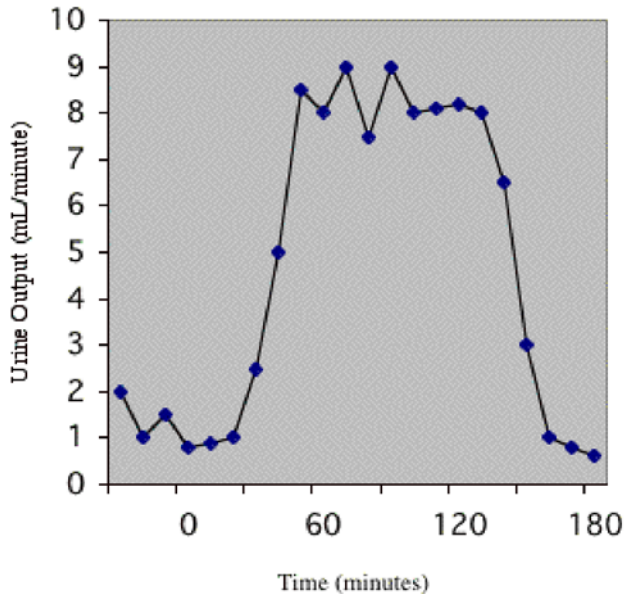
- 24) An investigation was carried out to determine the effect of drinking excessive amounts of water on urine flow. Urine was collected 3 times, at 10-minute intervals, from a subject. The subject then drank one liter of water at time marked zero. Urine output was again measured every 10 minutes and the results were recorded in the above graph.

How did the subject's urine flow change over the course of the experiment?



- A. The urine flow uniformly increased
 B. The urine flow uniformly decreased
 C. The urine flow remained unchanged
 D. The urine flow increased then decreased rapidly
 E. The urine flow had no discernable pattern
- 25) An investigation was carried out to determine the effect of drinking excessive amounts of water on urine flow. Urine was collected 3 times, at 10-minute intervals, from a subject. The subject then drank one liter of water at time marked zero. Urine output was again measured every 10 minutes and the results were recorded in the above graph.

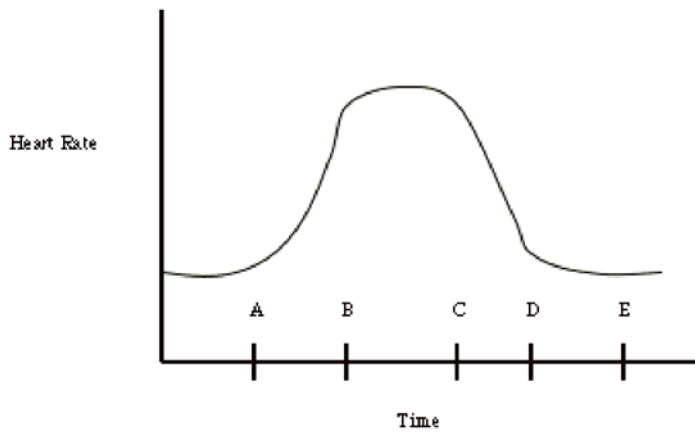
How does the body compensate when too much water is consumed?



- A. The urine flow remains unchanged
 B. The urine flow increases 400%
 C. The urine flow increases 200%
 D. The urine flow increases 100%
 E. The blood pressure increases during the next day

- 26) Shown above is a graph of Max's heart rate during a 2 hour period of time. Use the graph to answer the next question.

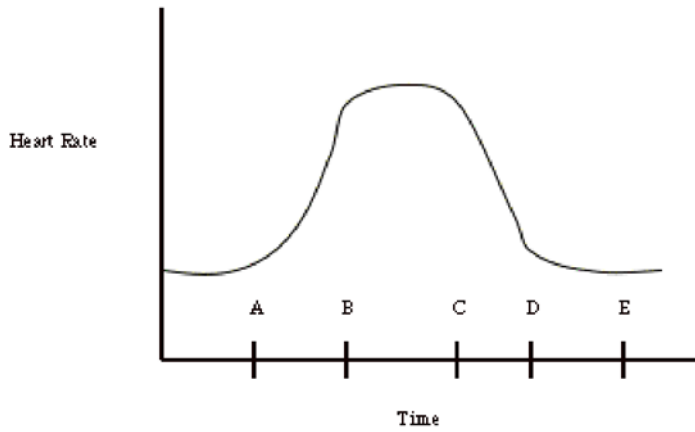
During which time period was Max's heart rate relatively constant?



- A. Between A and B
- B. Between B and C
- C. Between C and D
- D. Between A and C

27) Shown above is a graph of Max's heart rate during a 2 hour period of time. Use the graph to answer the next question.

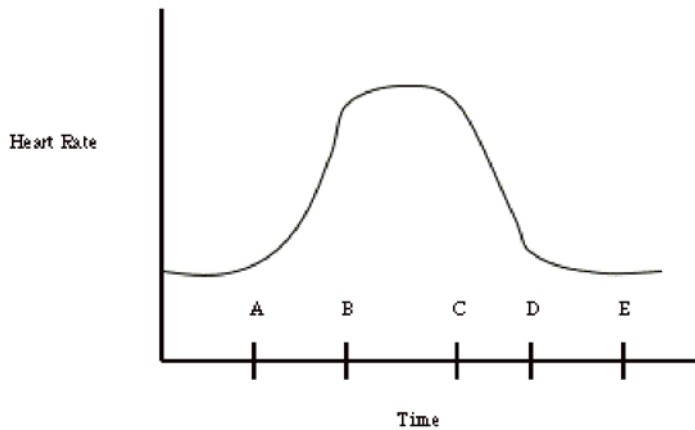
Based on the information in the graph, what was Max most likely doing from time A to time B?



- A. Watching T.V.
- B. Standing
- C. Eating
- D. Exercising
- E. Resting

28) Shown above is a graph of Max's heart rate during a 2 hour period of time. Use the graph to answer the next question.

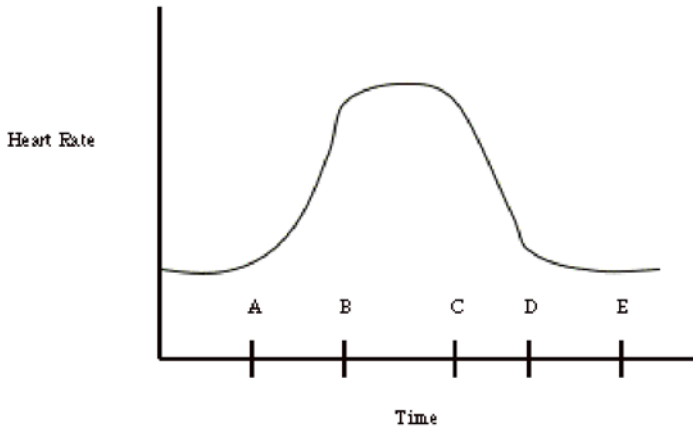
Which of the following could be an interpretation of the graph?



- A. Max took a depressant drug
- B. Max exercised then rested
- C. Max was listening to classical music
- D. Max fell asleep
- E. Max took an uneventful, leisurely walk through the woods

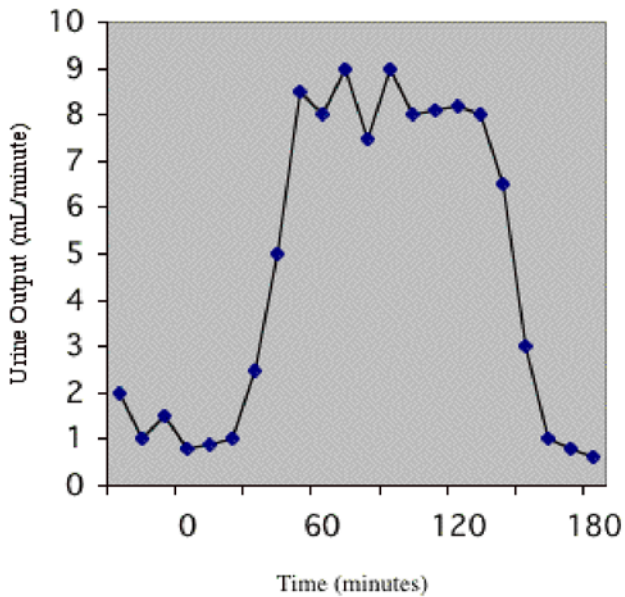
- 29) Shown above is a graph of Max's heart rate during a 2 hour period of time. Use the graph to answer the next question.

During which time period was Max's heart rate at the highest?



- A. A to B
 B. B to C
 C. C to D
 D. D to E
- 30) An investigation was carried out to determine the effect of drinking excessive amounts of water on urine flow. Urine was collected 3 times, at 10-minute intervals, from a subject. The subject then drank one liter of water at time marked zero. Urine output was again measured every 10 minutes and the results were recorded in the above graph.

What effect might drinking two Big Gulps from 7-11 have on a student?



- A. The student would become depressed because of all the sugar in the drinks
 B. The student would become dehydrated like drinking salt water
 C. The student will need to urinate in one or two hours
 D. The student will need to urinate immediately
 E. The drinks would have no effect since they are not pure water
- 31) In the above table, which substances are higher in concentration in the urine than in the blood?

Comparison of Materials in Blood and Urine		
	% in Blood	% in Urine
Water	92.0	96.0
Protein	7.0	0.0
Glucose	0.1	0.0
Sodium	0.33	0.25
Potassium	0.02	0.24
Urea	0.03	2.90

- A. water and protein
- B. protein and glucose
- C. glucose and sodium
- D. sodium and potassium
- E. potassium and urea

32) Students wanted to see if there was any relationship between the shape and structure of human bones and the purpose they serve.

Student A collected several human bones: tibia, skull, and scapula, placed them in their position in a model of a skeleton and inferred the function of each. The student concluded that "Even though they were located in different parts of the body they helped give the body shape and hold it together."

Student B look at X-rays of the bones and observed that the skull served to protect the brain, the long tibia helped the body move, and the flap of the scapula anchored a large muscle. She concluded that "Each bone's structure relates to its purpose."

Which student conducted a correct scientific investigation?

- A. Neither. They didn't write a hypothesis or record their data in a table.
- B. Student A only because he made inferences based on his observations.
- C. Student B only because she used a good instrument to collect data and she made a true conclusion.
- D. Both. They observed, collected data, and their conclusions related to their question and their data.

33) Many research hours have been spent studying the effect of caffeine on the nervous system and sleeping difficulties. It has been recommended, by food scientists that people reduce their intake of caffeine in the later afternoon and early evening so they will be able to sleep better. Which of the following statements best describes this scenario?

- A. Caffeine's use should be restricted to stop any digestive problems.
- B. Science provides much information, most of which is not relevant to humans.
- C. Science provides much information which can improve the quality of life.
- D. Caffeine's use should be increased as it helps make the heart beat stronger.

34) Which of the following does NOT describe a way technology has allowed us to use plants?

- A. Grinding trees into pulp to be made into things like paper and rayon.
- B. Find medicines in plants to treat diseases such as cancer.
- C. Cutting down trees to clear the land for a housing development.
- D. Use of genetic engineering to make crops stronger and resistant to disease.

35) Until the beginning of the 17th century people assumed that arteries carried a subtle kind of air or spirit to the organs, and that veins carried blood. But people did not realize veins and arteries were connected. The circulation of the blood was proposed in 1628 by William Harvey. Blood pressure was first measured in animals by Hales (1733). In 1941, Cournand developed a technique to insert tubes into veins. This allowed new research diagnoses and therapies. What does this account demonstrate?

- A. New technology is changing so rapidly that most scientists cannot take the time to learn about it or use it.
- B. Science is a separate field and is not affected much by the use of technology.
- C. Past discoveries are not related to current research.
- D. New science discoveries build on discoveries of the past.

36) Until the beginning of the 17th century, people assumed that arteries carried a kind of air or spirit to the organs, and that veins carried the nutrient blood, but they didn't realize that arteries and veins were connected. The circulation of the blood was proposed in 1628 by William Harvey. Blood pressure was first measured in animals by Hales (1733). In 1941 Cournand inserted tubes into the veins which generated much modern circulatory research, diagnosis and therapy. How does this research affect human life?

- A. We have modern machines to help keep people alive by breathing for them.

- B. We are better able to determine what humans need to eat for the best energy production.
- C. We are able to treat and cure many diseases related to the heart and blood vessels.
- D. We can make better replacement limbs for missing arms and legs.

37) Which of the following is NOT an example of an organ system?

- A. circulatory
- B. respiratory
- C. digestive
- D. sensory

38) Which term refers to the body's ability to maintain a stable, internal environment?

- A. modification
- B. protection
- C. metabolism
- D. organism

39) Which of the following terms refers to the transportation of nutrients through the body?

- A. protection
- B. digestion
- C. respiration
- D. circulation

40) Which of the following systems helps to control and coordinate the body's actions?

- A. digestive
- B. nervous
- C. respiratory
- D. circulatory

