

City and Guilds Animal Management Level 3 Biological Systems Practice Test (Sample)

Study Guide



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SAMPLE

Questions

- 1. What role does the skin play in waste removal?**
 - A. Stores excess salts**
 - B. Contains sweat glands that secrete waste**
 - C. Regulates breathing rates**
 - D. Filters blood**
- 2. What is a significant advantage of being an endotherm?**
 - A. They can regulate their body temperature internally**
 - B. They require more energy for their metabolic processes**
 - C. They are more reliant on external sources of heat**
 - D. They cannot grow as efficiently as ectotherms**
- 3. Which two parts make up the peripheral nervous system?**
 - A. Cerebral and mammalian systems**
 - B. Somatic and autonomic nervous systems**
 - C. Voluntary and involuntary nervous systems**
 - D. Cranial and spinal nerves**
- 4. What is the function of the liver in maintaining homeostasis?**
 - A. Regulating blood water concentration**
 - B. Controlling blood glucose levels**
 - C. Producing digestive enzymes**
 - D. Filtering out toxins**
- 5. Which components make up the nervous system?**
 - A. Brain, spinal cord, and muscles**
 - B. Neurons, sensory organs, and glands**
 - C. Brain, spinal cord, nerves, neurons, sensory organs**
 - D. Neurons, spinal column, and arteries**
- 6. During what process do reptiles utilize evaporation to cool down?**
 - A. Sitting in the sun to dry after wetting**
 - B. Gaping to inhale cooler air**
 - C. Panting to increase heat loss**
 - D. Bathing in cool water**

- 7. Which system is responsible for transmitting signals throughout the body?**
- A. The digestive system**
 - B. The nervous system**
 - C. The respiratory system**
 - D. The endocrine system**
- 8. How does the myelin sheath affect nerve impulse speed?**
- A. It slows down impulse transmission.**
 - B. It has no effect on speed.**
 - C. It speeds up impulse transmission.**
 - D. It converts impulses to electrical signals.**
- 9. What term is used to describe the transport medium or 'blood' in insects?**
- A. Hemoglobin**
 - B. Haemolymph**
 - C. Plasma**
 - D. Serum**
- 10. What is the final product collected by the kidneys as waste?**
- A. Water**
 - B. Urine**
 - C. Plasma**
 - D. Saliva**

Answers

SAMPLE

1. B
2. A
3. B
4. B
5. C
6. B
7. B
8. C
9. B
10. B

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Explanations

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1. What role does the skin play in waste removal?

- A. Stores excess salts
- B. Contains sweat glands that secrete waste**
- C. Regulates breathing rates
- D. Filters blood

The skin plays a significant role in waste removal primarily through its sweat glands, which are responsible for excreting substances like urea, salts, and water from the body. This process is vital for maintaining homeostasis, particularly in regulating body temperature and electrolyte balance. When sweat evaporates from the skin's surface, it helps cool the body while effectively removing waste products that have been filtered from the blood. This mechanism allows the body to eliminate some metabolic by-products and enhances the overall function of the excretory system. In contrast, other options do not accurately describe the skin's primary role in waste removal. Storing excess salts is not a function of the skin; instead, it deals with eliminating them through sweat. Regulating breathing rates is a function associated with the respiratory system rather than the skin. Lastly, filtering blood is a function of the kidneys, not the skin, which does not have the capability to filter blood independently.

2. What is a significant advantage of being an endotherm?

- A. They can regulate their body temperature internally**
- B. They require more energy for their metabolic processes
- C. They are more reliant on external sources of heat
- D. They cannot grow as efficiently as ectotherms

Being an endotherm allows these animals to maintain a stable internal body temperature regardless of the external environment. This thermoregulation provides a significant advantage, as it enables them to be active across a broader range of environmental conditions. For instance, endotherms can remain active during colder temperatures that might hinder ectothermic animals, which rely on external heat sources to elevate their body temperature. This internal regulation of temperature allows endotherms to sustain higher levels of metabolic activity. It also facilitates optimal functioning of their various physiological processes and enhances their endurance and performance in different habitats. Consequently, this adaptability can enhance their survival, reproduction, and overall ecological success compared to ectotherms, which are more limited by external temperature fluctuations.

3. Which two parts make up the peripheral nervous system?

- A. Cerebral and mammalian systems**
- B. Somatic and autonomic nervous systems**
- C. Voluntary and involuntary nervous systems**
- D. Cranial and spinal nerves**

The correct answer identifies the two components of the peripheral nervous system, which are the somatic and autonomic nervous systems. The somatic nervous system is responsible for voluntary movements, controlling skeletal muscles and facilitating sensory input from the body to the central nervous system. In contrast, the autonomic nervous system regulates involuntary bodily functions such as heartbeat, digestion, and respiratory rate, operating without conscious control. Understanding these two subdivisions is crucial because they illustrate the functionality of the peripheral nervous system in both conscious and unconscious activities, highlighting how it integrates sensory input and motor control throughout the body. Other options might refer to related concepts, but they do not accurately encompass the complete classification of the peripheral nervous system as this answer does.

4. What is the function of the liver in maintaining homeostasis?

- A. Regulating blood water concentration**
- B. Controlling blood glucose levels**
- C. Producing digestive enzymes**
- D. Filtering out toxins**

The liver plays a crucial role in maintaining homeostasis, particularly through the regulation of blood glucose levels. It performs this function by storing glucose as glycogen when blood glucose levels are high and releasing glucose back into the bloodstream when levels drop. This balancing act ensures that the body has a stable supply of energy and helps to prevent fluctuations that could lead to conditions such as hypoglycemia or hyperglycemia. While the liver does have other important functions, such as filtering toxins and contributing to digestion by producing bile, its central role in glucose homeostasis is vital for overall metabolic regulation. By adjusting the amount of glucose released or absorbed, the liver helps maintain the balance necessary for various bodily systems to operate effectively.

5. Which components make up the nervous system?

- A. Brain, spinal cord, and muscles
- B. Neurons, sensory organs, and glands
- C. Brain, spinal cord, nerves, neurons, sensory organs**
- D. Neurons, spinal column, and arteries

The nervous system is a complex network that coordinates and controls body functions through a series of electrical and chemical signals. The correct answer includes all the essential components of the nervous system: the brain, spinal cord, nerves, neurons, and sensory organs. The brain is the central processing unit, interpreting sensory information and coordinating responses. The spinal cord serves as the main pathway for transmitting messages between the brain and the rest of the body. Nerves are responsible for carrying these messages to and from various body parts. Neurons are the fundamental units of the nervous system, transmitting electrical impulses that communicate information. Sensory organs, such as the eyes and ears, detect stimuli from the environment and send this information to the brain for processing. The inclusion of all these elements illustrates the comprehensive nature of the nervous system, highlighting its role in both receiving information and executing responses, thereby demonstrating its critical importance in maintaining homeostasis and facilitating interaction with the environment.

6. During what process do reptiles utilize evaporation to cool down?

- A. Sitting in the sun to dry after wetting
- B. Gaping to inhale cooler air**
- C. Panting to increase heat loss
- D. Bathing in cool water

Reptiles primarily use gaping to cool down through the process of evaporation. When a reptile opens its mouth, it allows the moisture present in its oral cavity to evaporate. This evaporation process takes heat away from the body, functioning similarly to sweat in mammals. During hot conditions, gaping can help reptiles lower their internal body temperature and maintain homeostasis by promoting heat loss effectively. This method is particularly advantageous for reptiles, which are ectothermic (cold-blooded) and rely on environmental temperature for thermoregulation. In contrast, the other options represent different behaviors or methods that do not primarily focus on using evaporation for cooling. For instance, sitting in the sun typically raises body temperature, while bathing in cool water provides immediate cooling through conduction rather than evaporation. Panting, while common in some animals to facilitate heat loss, is not a typical method used by reptiles.

7. Which system is responsible for transmitting signals throughout the body?

- A. The digestive system**
- B. The nervous system**
- C. The respiratory system**
- D. The endocrine system**

The nervous system is the primary system responsible for transmitting signals throughout the body. It consists of the brain, spinal cord, and a complex network of nerves that reach every part of the body. This system uses electrical impulses and neurotransmitters to send messages quickly, allowing for rapid communication between different body parts. This capability enables the body to respond effectively to stimuli such as pain, temperature changes, or threats, facilitating coordination of movements and bodily functions. The nervous system plays a crucial role in ensuring that various organs and systems work in harmony, contributing to overall homeostasis and the body's adaptability to the environment. In contrast, the digestive system is primarily concerned with the breakdown of food and nutrient absorption, the respiratory system focuses on gas exchange, and the endocrine system regulates long-term processes through hormones. While these systems play significant roles in the body, they do not specialize in signal transmission like the nervous system does.

8. How does the myelin sheath affect nerve impulse speed?

- A. It slows down impulse transmission.**
- B. It has no effect on speed.**
- C. It speeds up impulse transmission.**
- D. It converts impulses to electrical signals.**

The myelin sheath significantly impacts the speed of nerve impulses, and its role in speeding up transmission is crucial for efficient communication within the nervous system. The myelin sheath is a fatty layer that surrounds the axons of many neurons. This insulation allows the electrical impulses (action potentials) to jump from one node of Ranvier to another through a process called saltatory conduction. In myelinated neurons, these nodes are gaps in the myelin sheath where the axonal membrane is exposed. This arrangement leads to much faster conduction speeds compared to unmyelinated neurons, where the impulse travels continuously along the entire length of the axon. By providing insulation and facilitating the jump of impulses between these nodes, the myelin sheath drastically increases the speed of neural communication, enabling rapid responses and efficient processing of information.

9. What term is used to describe the transport medium or 'blood' in insects?

- A. Hemoglobin**
- B. Haemolymph**
- C. Plasma**
- D. Serum**

The term used to describe the transport medium or 'blood' in insects is haemolymph. In the insect circulatory system, haemolymph plays a crucial role similar to that of blood in vertebrates. It circulates throughout the body, transporting nutrients, hormones, and waste products. Unlike blood, which contains red blood cells and hemoglobin for oxygen transport in vertebrates, haemolymph is a clear or yellowish fluid that does not carry oxygen in the same manner. Haemolymph is also important for other functions, including temperature regulation, nutrient storage, and defense against pathogens. The open circulatory system of insects allows haemolymph to flow freely within the body cavity, bathing the internal organs and tissues directly. This system is different from the closed circulatory systems found in mammals, where blood is confined to vessels. The other terms listed describe components associated with the circulatory systems of vertebrates. Hemoglobin is a protein specifically involved in oxygen transport in vertebrate blood. Plasma and serum are components of blood in vertebrates; plasma is the liquid part of the blood that carries cells and nutrients, while serum is the fluid that remains after blood coagulation. These terms do not apply to insects, reinforcing the uniqueness of haemolymph.

10. What is the final product collected by the kidneys as waste?

- A. Water**
- B. Urine**
- C. Plasma**
- D. Saliva**

The final product collected by the kidneys as waste is urine. This is the result of the kidneys' filtration process, where they remove waste products and excess substances from the blood. As blood passes through the kidneys, they filter out toxins, urea, and other metabolites, which are combined with water to form urine. Once urine is produced, it is stored in the bladder until it is expelled from the body. This process is essential for maintaining the body's fluid balance and removing harmful substances, thus highlighting the crucial role of the kidneys in the body's excretory system.