

Practice Test 05 — Answer Key

Module 9: Tissues and the Animal Body

Part A: Multiple Choice

1. **B** — Homeostasis is the maintenance of a stable internal environment.
2. **B** — A thermostat is a classic example of negative feedback: the response (heating) opposes the change (cold) to restore the set point.
3. **B** — Osmoregulation is specifically the regulation of water and salt balance.
4. **B** — The urinary (excretory) system, primarily the kidneys, regulates water and salt levels.
5. **B** — Chewing is mechanical digestion — physically breaking food into smaller pieces without changing its chemistry.
6. **C** — The small intestine is the primary site of nutrient absorption due to its large surface area (villi and microvilli).
7. **C** — The liver is an accessory organ; it produces bile to help digest fats. The pancreas and gallbladder are also accessory organs.
8. **C** — Arteries carry blood away from the heart (remember: A = Artery = Away).
9. **C** — Gas exchange happens at the alveoli — tiny air sacs in the lungs where O₂ enters the blood and CO₂ exits.
10. **B** — The left ventricle pumps blood to the entire body (systemic circulation), so it needs a thicker, more muscular wall to generate enough force.
11. **C** — Hormones are chemical messengers made by endocrine glands and transported through the bloodstream.
12. **C** — The pancreas releases insulin (lowers blood sugar) and glucagon (raises blood sugar).
13. **C** — The hypothalamus connects the nervous system to the endocrine system through the pituitary gland.
14. **C** — Skeletal muscle is voluntary, striated, and attached to bones.

15. **C** — Smooth muscle is involuntary and found in the walls of hollow organs (stomach, intestines, blood vessels).
16. **B** — The skeletal system also protects internal organs (e.g., the rib cage protects the heart and lungs) and produces blood cells in bone marrow.
17. **B** — The CNS is the brain and spinal cord.
18. **C** — The axon carries electrical signals away from the cell body toward other cells.

Part B: Fill in the Blank

1. **Opposes** — negative feedback reverses the change to restore balance.
2. **Arteries, Veins, Capillaries**
3. **Skeletal, Cardiac, Smooth**
4. **Sensory; Motor**

Part C: Short Answer

1. Negative vs. Positive Feedback:

- **Negative feedback:** The response opposes the original change to bring the body back to its set point. Example: Body temperature — when you overheat, you sweat to cool down; when you are cold, you shiver to warm up.
- **Positive feedback:** The response amplifies the original change, pushing the system further in the same direction until a specific event ends it. Example: Childbirth contractions — oxytocin increases contractions, which triggers more oxytocin, until the baby is delivered.

2. Path of Food:

- **Mouth:** Mechanical digestion (chewing) and chemical digestion (salivary amylase begins starch breakdown).
- **Esophagus:** Moves food to the stomach via peristalsis (muscular contractions).
- **Stomach:** Churns food (mechanical) and uses acid and enzymes (chemical) to break down proteins.
- **Small intestine:** Main site of chemical digestion (with help from liver, pancreas, gallbladder) and nutrient absorption into the bloodstream.

- **Large intestine:** Absorbs water and remaining minerals; compacts waste for elimination.

3. Three Muscle Types:

Feature	Skeletal	Cardiac	Smooth
Location	Attached to bones	Heart only	Walls of hollow organs
Appearance	Striated	Striated	Non-striated
Control	Voluntary	Involuntary	Involuntary
Special Feature	Multinucleated	Intercalated discs	Spindle-shaped cells

4. Hot Pan Response:

- **Nervous system:** Sensory neurons in your hand detect the heat and send a pain signal through the peripheral nerves to the spinal cord. The spinal cord triggers a reflex arc — sending a motor signal back to your arm before the signal even reaches your brain. (This is why you pull away before you consciously feel the pain.)
- **Muscular system:** Motor neurons stimulate skeletal muscles in your arm and hand to contract rapidly.
- **Skeletal system:** The bones of your arm and hand act as levers, allowing the muscle contraction to pull your hand away from the pan.
- All three systems work together in fractions of a second to protect you from a burn.