

4

Histology

Answers and Explanations

I. Definition and Classification of Tissues

A. Multiple Choice Questions

1. (d) – Tissues are classified using structural and functional attributes.
2. (a) – In a medical histology course, students learn what constitutes normal histological structure. A course in histology is usually followed by one in pathology, in which abnormal, or diseased, tissues are studied.
3. (a) – Epithelial tissues cover body organs and line body cavities, tubes, and ducts.
4. (b) – Cartilage is a specific type of connective tissue.

B. True–False Questions

1. True – Tissues fit between cells and organs in the levels of body organization.
2. False – In certain tissues, the matrix is semisolid and in others it is solid-rigid.
3. False – The outer layer of skin, called the epidermis, is composed of stratified squamous epithelial tissue.
4. True – Connective tissues bind and support structures or organs, such as muscles.

II. Developmental Exposition of Tissues

A. Multiple Choice Questions

1. (c) – For the most part, the placenta is derived from trophoblast cells that have specialized from the morula.
2. (b) – The formation of ectoderm and endoderm promotes the development of mesoderm. The hypodermis is not a primary germ layer.
3. (b) – The nervous system and the epidermis of the skin both form from ectoderm.

B. True–False Questions

1. False – A zygote is diploid. Twenty-three chromosomes are contributed by the sperm cell and 23 chromosomes are contributed by the ovum.
2. True – Most of the placenta develops from the trophoblast, and the remainder develops from maternal endothelial tissue.
3. False – This space is referred to as the amniotic cavity.
4. True – The endoderm forms the developing gut (GI tract) and structures that derive from the gut, such as the liver and pancreas.

III. Epithelial Tissue

A. Multiple Choice Questions

1. (a) – The thinness of simple squamous epithelium facilitates diffusion (e.g., within the pulmonary alveoli) and filtration (e.g., within the glomeruli of the kidneys).
2. (a) – Simple columnar epithelium lines the GI tract.
3. (d) – The fact that each cell of pseudostratified squamous epithelium contacts the basement membrane precludes stratification of the cells of this tissue.
4. (b) – Nonkeratinized stratified squamous epithelium is found lining the cavities that open into the body, such as the oral cavity and the anal cavity.
5. (c) – The distension capability of this epithelium permits the urinary bladder to expand as it stores urine.
6. (d) – Sebaceous glands of the skin are holocrine.

B. True–False Questions

1. True – Simple epithelia consist of a single layer of cells, so that each cell has an exposed surface and a surface in contact with the basement membrane.
2. True – These are specialized sensory epithelial cells, such as those within the nasal cavity.
3. True – The process of mitosis within this layer ensures replenishment of worn and damaged cells on the exposed surface.
4. True – The process of dehydration and flattening is called cornification.
5. False – A rich blood supply into the epithelial layer composing the wall of the oral cavity ensures that the cells of this layer remain alive.
6. False – Unicellular exocrine glands are ductless; multicellular exocrine glands secrete through ducts to the surface of tissues.

C. Labeling Questions

1. simple tubular;
intestinal glands;
aid digestion
2. simple coiled tubular;
sweat glands;
regulate temperature
3. branched acinar;
sebaceous glands of the skin;
skin conditioners

IV. Connective Tissue

A. Multiple Choice Questions

1. (d) – Fibroblasts are remarkable in their ability to differentiate.
2. (a) – Loose connective tissue is a binding and packing type tissue.
3. (c) – Tightly packed, interwoven collagenous fibers within tendons and ligaments provide incredible strength as well as flexibility.
4. (b) – The derivation of this term conveys its meaning: *peri*– means “around”; *chondro* means “cartilage.”
5. (a) – The fibrocartilage in intervertebral discs permits compression, which facilitates spinal movements.
6. (c) – There is a single osteocyte in each lacuna (plural, lacunae).
7. (d) – Critical numbers of healthy platelets (thrombocytes) facilitate clotting.

B. True–False Questions

1. True – Mesenchyme is found only in the embryo, where it plays a crucial role in the formation of organs.
2. False – Mast cells actually produce an anticoagulant, heparin.
3. False – The lipid content is eliminated from the tissue, but the cells remain.
4. False – Fibrocartilage is found at the symphysis pubis, and hyaline cartilage is found between the ribs and the sternum.
5. True – The mineralized matrix of bone tissue gives the skeletal system its strength.
6. False – The hardness is due to the calcium phosphate crystals within the bone matrix; collagenous fibers provide some flexibility.

C. Matching Questions

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| 1. (g) | 5. (a) |
| 2. (d) | 6. (e) |
| 3. (f) | 7. (b) |
| 4. (c) | |

V. Muscle Tissue

A. Multiple Choice Question

1. (b) – The intercalated discs of muscle tissue help to hold adjacent fibers together.
2. (c) – Of the three muscle tissue types, only skeletal muscle fibers are multinucleated.

B. True–False Questions

1. True – Being elongated in this direction provides maximum strength during contraction.
2. False – Smooth muscle is nonstriated and involuntary.
3. False – The fibers of skeletal muscles are elongated and multinucleated, but they do not bifurcate.

VI. Nervous Tissue

A. Multiple Choice Questions

1. (a) – A dendrite receives a stimulus and passes the impulse through the cell body and axon of the neuron.
2. (d) – The nucleus of a neuron is contained within the cell body.

B. True–False Questions

1. False – A nerve fiber is generally considered to be the axon of a neuron. It may be myelinated or nonmyelinated.
2. False – Neurons are the basic units; neuroglia assist the neurons in various ways.
3. True – Neuroglia can mitotically divide, but neurons cannot.
4. False – Only the neurons transmit nerve impulses.

VII. Clinical Considerations

A. Multiple Choice Questions

1. (a) – Atrophy is the consequence of lack of use.
2. (c) – The prefix *iso*– means “equal”; “like.”

B. True–False Questions

1. True – Necrosis is derived from the Greek *nekros*, meaning “corpse.”
2. False – Living tissue is removed during a biopsy, although it dies shortly thereafter.

VIII. Chapter Review

A. Completion Questions

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|-----------------------------|------------------------|
| 1. matrix | 10. neuroglia |
| 2. primary germ | 11. basale |
| 3. basement membrane | 12. Exocrine |
| 4. endothelium/mesothelium | 13. ground substance |
| 5. compound acinar/apocrine | 14. mesenchyme |
| 6. Goblet | 15. edema |
| 7. keratin | 16. lacunae |
| 8. heparin | 17. intercalated discs |
| 9. Leukocytes | 18. nerve fiber |