

5

Integumentary System

Answers and Explanations

I. The Integument as an Organ

A. Multiple Choice Questions

1. (d) – The skin varies in thickness, ranging from thin on the eyelids and portions of the genitalia to thick on the palms of the hands and soles of the feet.
2. (d) – The sweat glands, fingernails, and sebaceous glands derive from the epidermis of the skin during prenatal development.
3. (b) – The tympanum, or eardrum, is only a few cell layers thick.
4. (d) – Most fair-skinned people are not adversely affected by normal exposure to sunlight.

B. True–False Questions

1. True – The skin accounts for approximately 7% of a person's body weight.
2. False – Fingernails are derived from the epidermis of the skin.
3. False – Thin skin enhances sensitivity and thick skin affords greater protection.

II. Layers of the Integument

A. Multiple Choice Questions

1. (b) – Keratinization is a change in the protein composition of the stratum granulosum of the skin as a result of cellular death.
2. (d) – The epidermis of the palms and soles has five layers. In all other areas of the body, the epidermis has four layers.
3. (d) – This sequence of epidermal layers is from the surface to the deepest layers.
4. (c) – Keratin does not contribute to the color of the skin.
5. (a) – The reticular layer of the dermis is deep to the papillary layer. Excessive stretching of this portion of the skin, such as over the abdomen during pregnancy, results in linea albicantes.
6. (b) – Abundant adipose tissue is characteristic of the hypodermis of the skin.
7. (a) – The hypodermis is 8% to 10% thicker in females than in males.

B. True–False Questions

1. True – The number of melanocytes is established by birth and is basically the same for all people.
2. False – Difference in skin color is primarily due to differences in the ability of the melanocytes to produce melanin.
3. True – Friction ridges are established prenatally and are due to the pull of elastic fibers within the papillary layer of the dermis.
4. False – Flexion lines form in response to the repeated closing of one's hand.
5. False – It is the gradual loss of elastic fibers that accounts for the wrinkled appearance of one's skin.
6. True – During vasodilation, the blood flows closer to the surface of the body where excess heat can be readily dissipated. During vasoconstriction, body heat is retained.

III. Functions of the Integument

A. Multiple Choice Questions

1. (c) – The flattening and drying of the stratum corneum during the process of cornification makes the skin an effective barrier against desiccation.
2. (d) – Effective heat loss is important in maintaining a constant body temperature.
3. (b) – The arrectores pilorum (singular, arrector pili) contract involuntarily in response to low temperatures.
4. (a) – Sunlight is important in the production of vitamin D.

B. True–False Questions

1. False – The oily secretions from sebaceous glands form a protective acidic film, with a pH of about 6.8.
2. True – Personal appearance, which in large measure is related to the condition of the skin, is an important factor in determining one’s social acceptance.

IV. Epidermal Derivatives

A. Multiple Choice Questions

1. (c) – The follicle is an integumentary structure in which the hair develops.
2. (d) – The type and amount of pigment present in hair is determined by genetics, and the air spaces in the hair shaft are a factor of aging.
3. (c) – Arrector pili muscles respond to low temperatures by autonomically contracting and generating body heat.
4. (d) – Lanugo is a fine, silky fetal hair that appears during the last trimester of development.
5. (b) – Angora hair grows continuously in length.
6. (a) – Sebum is the oily secretion from sebaceous glands.

B. True–False Questions

1. True – Although the density of hair is similar in males and females, the appearance is significantly different.
2. True – A rounded diameter results in straight hair, an oval diameter results in wavy hair, and a flattened diameter results in kinky hair.
3. False – Lanugo is fetal hair, not infant hair.
4. False – Apocrine glands are found only in the axillae (armpits) and pubic area.
5. True – Mammary glands are specialized sweat glands.

V. Developmental Exposition of the Integumentary System

A. Multiple Choice Questions

1. (d) – The epidermis and epidermal derivatives (hair, glands, and nails) form from ectoderm.
2. (a) – The dermis develops from mesenchyme, a thickened layer of undifferentiated mesoderm.
3. (c) – The periderm is superficial and the germinal layer is deep.
4. (b) – The germinal layer is mitotically active and produces cells for the epidermis and associated structures.
5. (d) – Hair follicles consist of germinal cells and supporting structures.

B. True–False Questions

1. True – The epidermis, hair, glands, and nails form from the ectodermal germ layer.
2. True – The vernix caseosa is a protective coating on the skin surface of a fetus.
3. False – Melanocytes produce melanin.
4. True – Sebum is the oily secretion of sebaceous glands.
5. False – Mammary glands are modified sudoriferous glands.

VI. Clinical Considerations

A. Multiple Choice Questions

1. (b) – Melanoma is an aggressive skin cancer that is frequently fatal.
2. (c) – In a second-degree burn, the stratum basale and the upper levels of the dermis are damaged.
3. (d) – Blistering followed by complete recovery generally characterizes first-degree and second-degree burns. Recovery from a second-degree burn is usually slow.

B. True–False Questions

1. False – Skin transplants are generally successful.
2. True – Inflammation and a slight elevation of body temperature both aid the healing process.
3. True – Granulation formation from fibroblasts accounts for the formation of scars in extensive wounds.

C. Completion Questions

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| 1. scar | 3. alopecia |
| 2. seborrheic hyperkeratoses | 4. Melanoma |

D. Matching Questions

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| 1. (f) | 5. (i) | 9. (c) |
| 2. (k) | 6. (g) | 10. (e) |
| 3. (a) | 7. (h) | 11. (b) |
| 4. (d) | 8. (j) | |

VII. Chapter Review

A. Completion Questions

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| 1. ectoderm/mesoderm | 9. sebaceous |
| 2. organ/7 | 10. Second-degree |
| 3. keratinization/cornification | 11. vernix caseosa |
| 4. melanocytes | 12. carotene/hemoglobin |
| 5. decubitus ulcer | 13. Cyanosis |
| 6. hypothermia | 14. linea albicans |
| 7. vitamin D | 15. Hirsutism |
| 8. arrector pili | 16. cortex/cuticle |

B. Matching Questions

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|--------|---------|
| 1. (i) | 6. (c) |
| 2. (g) | 7. (j) |
| 3. (f) | 8. (b) |
| 4. (e) | 9. (a) |
| 5. (d) | 10. (h) |