Chapter 5: Integumentary System

I. Overview of the Integumentary System
   A. List the five major functions of the integumentary system:
      1. ____________________________________________________
      2. ____________________________________________________
      3. ____________________________________________________
      4. ____________________________________________________
      5. ____________________________________________________

II. Skin
   A. Epidermis
      1. The epidermis consists of ________________________________
      2. Most cells of the epidermis are __________________________
      3. Where are new cells formed? _____________________________
      4. What is it called when surface cells slough off? ____________
      5. What does the process of keratinization refer to: _____________
      6. Stratum Basale - deepest layer of epidermis
         a. This is composed of _________________________________
         b. What anchors this layer to the basement membrane? ________
         c. This layer produces new cells by the process of ______________
            1. One daughter cell _________________________________
            2. The other daughter cell _______________________________
         d. How long does it take a cell to desquamate? _______________
      7. Stratum Spinosum
         a. This layer is composed of _______________________________
         b. The spine like appearance in the microscope is due to _________
         c. What does the term “Stratum Germinativum” refer to: __________
      8. Stratum Granulosum
         a. This layer is composed of _______________________________
         b. Contains protein granules of ______________________________
c. The nucleus and organelles ________________ & the cell ______

9. Stratum Lucidum
   a. This layer appears as _______________________________
   b. This layer consists of _______________________________

10. Stratum Corneum - the most superficial layer
    a. This layer consists of _______________________________
    b. What is a “cornified cell”? __________________________
    c. What is keratin? ________________________________
    d. The structural strength of the stratum corneum is due to ________
       and _______________

B. Thick and Thin Skin
    1. Thick skin has how many epithelial strata? ___________
    2. Where would you find thick skin? __________________________
    3. What is responsible for the ridges of thick skin?____________
    4. Functionally the ridges ________________ &_______________
    5. What layer is absent from thin skin? _______________________
    6. Which type of skin is more flexible? _______________________
    7. Which type of skin will have hair? _________________________
    8. What causes a callus to develop? _________________________
    9. Where would you find a corn? ___________________________

C. Skin Color
    1. Melanin
       a. What amino acid is used to produce melanin? ____________
       b. Melanin is produced by ________________________________
       c. What is a melanosome? _________________________________
       d. Describe how melanin gets inside keratinocytes: __________
       e. Melanin production is determined by:
          1. ________________________________
2. _______________ ______________
3. _______________ ______________
f. Genetics determines the:
   1. ___________ and ___________ of melanin produced by melanocytes
   2. __________, __________ & __________ of melanosomes
g. Hormones usually increase melanin production during ___________
h. Exposure to ultraviolet light ________________ & _____________
2. Carotene
   a. Is a ___________ pigment commonly found in ________________
   b. Excess carotene accumulates in the _____________ & __________
      1. This gives the skin a ____________________________
3. Hemoglobin
   a. Blood flowing through the skin gives it a ________________
   b. What does cyanosis mean? _______________________________
D. Dermis
   1. The dermis is responsible for most of ______________________
   2. What is the main connective tissue fiber present? ______________
   3. Reticular Layer - main layer of dermis
      a. Is this layer deep or superficial? ______________________
      b. This layer is composed of __________________________
      c. What is responsible for cleavage or tension lines?
      __________________________________________________
      d. When the dermis ruptures it may produce __________________
   4. Papillary Layer
      a. The layer is named for ________________________________
      b. The layer is composed of _____________________________

III. Hypodermis
   A. It consists of ________________ with _________ & ____________
   B. When not part of the skin it is also called __________ or ____________
IV. Accessory Skin Structures

A. Hair

1. Define the following three hair terms:
   a. Lanugo ________________________________
   b. Vellus hairs ________________________________
   c. Terminal hairs ________________________________

2. Hair structure
   a. What part of the hair is found above the skin surface? __________
   b. What is the name for the hair part below the skin surface? __________
   c. What is the hair bulb? _________________________________
   d. What is the dermal root sheath? ____________________________
   e. What is the epithelial root sheath? ____________________________
   f. Where is the matrix found? _________________________________
      1. What is produced by the matrix? ____________________________

3. Hair Growth
   a. During the growth stage _________________________________
   b. What happens to the hair at the end of the resting stage? ______

4. Hair Color
   a. Color is due to the amount of ____________________________
   b. What causes hair color to fade or become white? _______________

B. Muscles

1. What are the arrector pili? _________________________________

2. How does hair position change when the arrector pili contract? ______
   a. The raised areas produced by this movement are called_________

3. What two events can cause the arrector pili to contract?
   a. _________________________________
   b. _________________________________

4. What two benefits do most animals receive from this response?
   a. _________________________________
   b. _________________________________
C. Glands

1. Sebaceous Glands
   a. The glands are located in the _____________________
   b. Structurally they are simple ______________________
   c. These glands produce ______________________
       1. This substance is __________________ rich in __________
   d. How do sebaceous glands release sebum? ______________
       1. Therefore functionally sebaceous glands are classified as ______
   e. Most sebaceous glands are connected to __________________
   f. What are the two functions of sebum?
       1. ______________________________
       2. ______________________________

2. Sweat Glands or Sudoriferous Glands
   a. Which type of sweat gland is most common? ______________
   b. Describe the composition of merocrine (eccrine) sweat gland secretions: _________________________________
   c. What does sweat do for a person? ______________________
   d. Where are apocrine sweat glands found in humans? ____________
   e. Apocrine sweat glands become active at ____________________
   f. Body odor from sweat is the result of ______________________

3. Ceruminous Glands
   a. Ceruminous glands are located in _________________________
   b. Cerumen is the combined secretions of _____________ & ______
   c. Functionally cerumen _________________________________

D. Nails

1. List three functions of nails:
   a. _________________________________
   b. _________________________________
   c. _________________________________
2. Define the following terms related to nails:
   a. Nail root ______________________________________________
   b. Nail body ______________________________________________
   c. Nail fold ______________________________________________
   d. Nail groove ____________________________________________
   e. Eponychium ____________________________________________
   f. Hyponychium ___________________________________________
   g. Nail bed _______________________________________________
   h. Nail matrix _____________________________________________
   i. Lunula ________________________________________________

3. The nail is composed of ________________________________

V. Summary of Integumentary System Functions

A. Describe six ways in which the integumentary system is involved in protection:
   1. _________________________________________________________
   2. _________________________________________________________
   3. _________________________________________________________
   4. _________________________________________________________
   5. _________________________________________________________
   6. _________________________________________________________

B. Sensations
   1. What sensations do we experience because of receptors in the integumentary system? ________________________________
2. The epidermis and dermal papillae are well supplied with __________
3. The dermis and deeper tissues contain receptors for:
   a. __________________________
   b. __________________________
   c. __________________________
   d. __________________________
   e. __________________________

C. Temperature Regulation
1. For the body to loose excess heat:
   a. Blood vessels in the dermis ______________
   b. Sweat spreads over the skin ______________
2. For the body to conserve heat dermal blood vessels __________
3. Does contraction of arrector pili in humans prevent heat loss? ______

D. Vitamin D Production
1. Functionally Vitamin D is important in raising blood levels of:
   a. __________________________
   b. ______________________________
2. Vitamin D production requires the skin to be exposed to __________

E. Excretion
1. List three waste products contained in sweat:
   a. __________________________
   b. __________________________
   c. __________________________
2. The quantity of waste products in sweat is ______________

VI. Effects of Aging on the Integumentary System
A. List two reasons the skin is more easily damaged as a person gets older:
   1. ______________________________
   2. ______________________________
B. What causes the skin to sag and wrinkle? __________________
   & __________________________
C. Why does the skin become drier? ________________________________
D. Elderly often suffer from heat prostration because __________________
E. Generally the number of functioning melanocytes ________________
F. What causes age spots? ________________________________