Short Answer

Using Figure 4.1, identify the following:
1) The region that contains adipose tissue is indicated by letter ___________.
   Answer: D
   Diff: 2  Page Ref: 115

2) The hair follicle is indicated by letter ___________.
   Answer: F
   Diff: 1  Page Ref: 121

3) The structure that is responsible for whorled ridges on the epidermal surfaces is indicated by letter ___________.
   Answer: A
   Diff: 1  Page Ref: 117

4) The structure that pulls the hair follicle into an upright position is indicated by letter ___________.
   Answer: B
   Diff: 2  Page Ref: 122

5) The gland that produces a mixture of oily substances and fragmented cells is indicated by label ___________.
   Answer: C
   Diff: 2  Page Ref: 119
6) The gland that produces sweat is indicated by label __________.
Answer: E
Diff: 2 Page Ref: 119–120

Fill in the blank or provide a short answer:
7) The deepest layer of the dermis is called the __________ layer.
Answer: reticular
Diff: 2 Page Ref: 118

8) In a hair, the outermost single layer of cells that overlap one another like shingles is called the __________.
Answer: cuticle
Diff: 2 Page Ref: 121

9) The part of a hair that projects from the surface of the scalp or skin is called the __________.
Answer: shaft
Diff: 1 Page Ref: 121

10) The sebaceous glands produce __________.
Answer: oil (sebum)
Diff: 1 Page Ref: 119

11) The skin that covers the palms of the hands and the soles of the feet has an extra layer of epidermis called the stratum __________.
Answer: lucidum
Diff: 2 Page Ref: 117

12) The dermis is composed of the reticular and __________ layers.
Answer: papillary
Diff: 1 Page Ref: 117

13) “Goosebumps” are caused by contractions of the __________ muscles.
Answer: arrector pili
Diff: 1 Page Ref: 122

14) The type of burn that involves injury to the epidermis and the upper region of the dermis and is red, blistered, and painful is termed as a __________-degree burn.
Answer: second
Diff: 1 Page Ref: 124

15) The white, cheesy-looking substance that is produced by the sebaceous glands and protects a baby’s skin while it is floating in its water-filled sac inside the mother is called __________.
Answer: vernix caseosa
Diff: 1 Page Ref: 127

16) The part of the hair enclosed in the follicle is known as the __________.
Answer: root
Diff: 2 Page Ref: 121

17) The white crescent area located over the nail matrix is called the __________.
Answer: lunula
Diff: 1 Page Ref: 122
18) The layer of the serous membrane that covers an organ is known as the __________ layer.
   Answer: visceral
   Diff: 3   Page Ref: 112

19) The type of connective tissue membrane found in joints is the __________.
   Answer: synovial membrane
   Diff: 2   Page Ref: 112

20) The two major categories of membranes are __________ and __________.
   Answer: epithelial membranes; connective membranes
   Diff: 1   Page Ref: 110

21) Epithelial membranes contain two types of tissue, __________ and __________ tissue.
   Answer: epithelial; connective
   Diff: 2   Page Ref: 110

Multiple Choice

1) The categories of epithelial tissue membranes are:
   A) synovial, cutaneous, and mucous membranes
   B) synovial, cutaneous, and serous membranes
   C) synovial, mucous, and serous membranes
   D) synovial, mucous, and cutaneous membranes
   E) mucous, cutaneous, and serous membranes
   Answer: E
   Diff: 2   Page Ref: 110-112

2) Which type of membrane contains fluid between the visceral and perietal layers:
   A) synovial
   B) serous
   C) cutaneous
   D) mucous
   E) connective
   Answer: B
   Diff: 2   Page Ref: 112

3) Which of the following relationships is incorrect:
   A) visceral peritoneum – covers the outer surface of the small intestine
   B) parietal pericardium – covers the outer surface of the heart
   C) parietal pleura – lines the wall of thoracic cavity
   D) visceral pleura – lines the surface of the lungs
   E) parietal peritoneum – lines the wall of the abdominal cavity
   Answer: B
   Diff: 1   Page Ref: 112
4) Which of the following is a connective tissue membrane:
   A) synovial membrane
   B) cutaneous membrane
   C) mucous membrane
   D) serous membrane
   E) pleural membrane
Answer: A
Diff: 1    Page Ref: 112

5) The only dry membrane is the:
   A) synovial membrane
   B) cutaneous membrane
   C) mucous membrane
   D) serous membrane
   E) basement membrane
Answer: B
Diff: 1    Page Ref: 110

6) Synovial membranes are found in the:
   A) joint cavities
   B) covering of the heart
   C) lining of the stomach cavity
   D) covering of the brain
   E) lining of the abdominal cavity wall
Answer: A
Diff: 1    Page Ref: 112

7) Sweat glands associated with hair are:
   A) sebaceous glands
   B) sudoriferous glands
   C) eccrine glands
   D) sebaceous glands and eccrine glands
   E) sudoriferous glands and eccrine glands
Answer: B
Diff: 3    Page Ref: 119

8) Which of the following is a vital function of the skin:
   A) it converts modified epidermal cholesterol to vitamin D
   B) it aids in the transport of materials throughout the body
   C) the cells of the epidermis store glucose as glycogen for energy
   D) it absorbs vitamin C so that the skin will not be subject to diseases
   E) it aids in desiccation
Answer: A
Diff: 1    Page Ref: 115
9) Although you get wet while swimming, a tough protein within the skin prevents it from soaking up moisture like a sponge. This substance is:
   A) serous fluid
   B) melanin
   C) mucus
   D) carotene
   E) keratin
   Answer: E
   Diff: 1 Page Ref: 115

10) The epidermis is composed of:
    A) simple columnar epithelium
    B) stratified squamous epithelium
    C) adipose tissue
    D) areolar tissue
    E) dense fibrous connective tissue
    Answer: B
    Diff: 2 Page Ref: 115

11) The uppermost layer of skin is:
    A) called the dermis
    B) full of keratin
    C) fed by a good supply of blood vessels
    D) called the hypodermis
    E) composed of dense connective tissue
    Answer: B
    Diff: 2 Page Ref: 115

12) The hypodermis consists of:
    A) simple columnar epithelium
    B) stratified squamous epithelium
    C) adipose tissue
    D) loose connective tissue
    E) dense fibrous connective tissue
    Answer: C
    Diff: 1 Page Ref: 115

13) A needle would pierce the epidermal layers of the forearm in which order:
    1. stratum basale
    2. stratum corneum
    3. stratum granulosum
    4. stratum lucidum
    5. stratum spinosum
    A) 2, 3, 5, 1
    B) 1, 5, 3, 4, 2
    C) 2, 4, 3, 5, 1
    D) 1, 3, 5, 2, 4
    E) 2, 3, 4, 1, 5
    Answer: A
    Diff: 3 Page Ref: 115-117
14) Which of the following homoeostatic imbalances is caused by skin exposure to chemicals:
   A) athlete's foot
   B) cold sores
   C) impetigo
   D) contact dermatitis
   E) cyanosis
   Answer: D

   Diff: 2    Page Ref: 123

15) The "tanning" effect (darkening of the skin) that occurs when a person is exposed to the sun is due to:
   A) melanin
   B) keratin
   C) oil
   D) Langerhans cells
   E) sweat
   Answer: A

   Diff: 1    Page Ref: 117

16) The layer of the epidermis in which cells first die because of their inability to get nutrients and oxygen is the:
   A) stratum spinosum
   B) stratum granulosum
   C) stratum basale
   D) stratum corneum
   E) stratum lucidum
   Answer: E

   Diff: 2    Page Ref: 115-117

17) Melanocytes are found in the:
   A) stratum spinosum
   B) stratum lucidum
   C) stratum corneum
   D) stratum basale
   E) stratum granulosum
   Answer: D

   Diff: 2    Page Ref: 117

18) A splinter penetrates to the deepest layer of the epidermis on your foot. This layer is:
   A) stratum basale
   B) stratum corneum
   C) stratum granulosum
   D) stratum lucidum
   E) stratum spinosum
   Answer: A

   Diff: 3    Page Ref: 115-116
19) Epidermal cells that are actively mitotic and replace superficial cells that are continually rubbed off are:
   A) stratum granulosum cells
   B) stratum corneum cells
   C) stratum lucidum cells
   D) stratum spinosum cells
   E) stratum germinativum cells
Answer: E
Diff: 2       Page Ref: 116

20) Nutrients reach the surface of the skin (epidermis) through the process of:
   A) absorption
   B) evaporation
   C) filtration
   D) diffusion
   E) osmosis
Answer: D
Diff: 1       Page Ref: 116

21) Which of the following is NOT a true statement about the papillary layer of the dermis:
   A) it is the deepest layer of the skin
   B) it produces the pattern for fingerprints
   C) it contains nerve endings that respond to touch and temperature stimuli
   D) it is highly vascular
   E) it is located immediately beneath the epidermis
Answer: A
Diff: 1       Page Ref: 117-118

22) In order to warm the body up when cold:
   A) vitamin D is synthesized
   B) sudoriferous glands release sweat
   C) sebaceous glands release oil
   D) the arrector pili muscles contract to stand hairs upright
   E) melanin is produced
Answer: D
Diff: 2       Page Ref: 122

23) Finger-like upward projections of the dermis into the epidermis are called:
   A) hair follicles
   B) hair bulbs
   C) Meissner’s corpuscles
   D) dermal papillae
   E) Pacinian corpuscles
Answer: D
Diff: 2       Page Ref: 117
24) Nails are composed of:
   A) melanin
   B) hemoglobin
   C) keratin
   D) sebum
   E) carotene
Answer: C  
*Diff: 1  Page Ref: 122*

25) The secretions of the eccrine glands are:
   A) primarily uric acid
   B) 99% water, sodium chloride, and trace amounts of wastes, lactic acid, and vitamin C
   C) fatty substances, proteins, antibodies, and trace amounts of minerals and vitamins
   D) solely metabolic wastes
   E) basic
Answer: B  
*Diff: 2  Page Ref: 120*

26) The secretion of sweat is stimulated:
   A) by high temperatures
   B) when the air temperature drops
   C) by hormones, especially male sex hormones
   D) as a protective coating when one is swimming
   E) both by high temperatures and by hormones, especially male hormones
Answer: E  
*Diff: 3  Page Ref: 120*

27) Sudoriferous glands are important for:
   A) production of keratin
   B) keeping skin and hair cells soft and flexible
   C) production of sweat
   D) body heat regulation
   E) production of vitamin D
Answer: D  
*Diff: 1  Page Ref: 119–120*

28) Inflammation of the hair follicles and sebaceous glands is called:
   A) impetigo
   B) alopecia
   C) psoriasis
   D) boils
   E) contact dermatitis
Answer: D  
*Diff: 2  Page Ref: 123*
29) What is the first threat to life from a massive third-degree burn:
   A) infection
   B) dehydration
   C) unbearable pain
   D) loss of immune function
   E) blood loss
   Answer: B  
   Diff: 2  Page Ref: 124

30) A physician estimates the volume of fluid lost in a severely burned patient by:
   A) measuring urinary output and fluid intake
   B) observing the tissues that are usually moist
   C) blood analysis
   D) using the “rule of nines”
   E) performing enzyme studies
   Answer: D  
   Diff: 1  Page Ref: 124

31) Which of the following is an indication of melanoma:
   A) a symmetrical mole
   B) a pigmented spot that has smooth borders
   C) a spot on the skin that is smaller than the size of a pencil eraser
   D) a pigmented spot that is black
   E) a pigmented spot that contains areas of different colors
   Answer: E  
   Diff: 1  Page Ref: 126

32) Acne and seborrhea are caused by problems with:
   A) eccrine glands
   B) nail beds
   C) sudoriferous glands
   D) sebaceous glands
   E) hair follicles
   Answer: D  
   Diff: 2  Page Ref: 119

33) Male pattern baldness has a genetic switch that turns on in response to:
   A) age
   B) size
   C) weight
   D) male hormones
   E) female hormones
   Answer: A  
   Diff: 1  Page Ref: 127
34) The membrane shown in Figure 4.2 is:
   A) cutaneous membrane
   B) synovial membrane
   C) pericardium, a serous membrane
   D) mucous membrane
   E) pleura, a serous membrane
   Answer: E
   Diff: 2   Page Ref: 111–112

True/False

1) Membranes that line body cavities that have openings to the exterior of the body are called mucous membranes.
   Answer: TRUE
   Diff: 1   Page Ref: 110–112

2) The serous membrane that covers the external surface of both lungs is called the visceral pleura.
   Answer: TRUE
   Diff: 1   Page Ref: 112

3) When an individual is exposed to extremely low air temperatures, the capillaries of the skin will dilate so that blood will flush into skin capillary beds and heat will be dissipated.
   Answer: FALSE
   Diff: 3   Page Ref: 118

4) The outermost layer of the epidermis is the stratum basale.
   Answer: FALSE
   Diff: 1   Page Ref: 115–116
5) The pinkish hue of healthy individuals with fair skin is the result of the crimson color of oxygenated hemoglobin circulating in the dermal capillaries and reflecting through the dermis.
  Answer: TRUE
  Diff: 2    Page Ref: 118

6) The major portion of the skin is comprised of the dermis.
  Answer: TRUE
  Diff: 1    Page Ref: 117

7) The epidermis is made up of stratified squamous epithelium.
  Answer: TRUE
  Diff: 2    Page Ref: 115

8) Skin is also known as a synovial membrane.
  Answer: FALSE
  Diff: 1    Page Ref: 110; 114

9) A serous membrane is composed of a layer of simple squamous epithelium resting on a thin layer of areolar connective tissue.
  Answer: TRUE
  Diff: 1    Page Ref: 112

10) Eccrine and apocrine glands are the two types of sebaceous glands.
    Answer: FALSE
    Diff: 1    Page Ref: 119

11) Melanin is found in the uppermost layer of skin and helps prevent water loss.
    Answer: FALSE
    Diff: 1    Page Ref: 117

12) Hair is produced by the hair bulb and is composed primarily of dead keratinized cells.
    Answer: TRUE
    Diff: 1    Page Ref: 121

13) The thickened, proximal area of the nail is called the nail matrix, and it is responsible for nail growth.
    Answer: TRUE
    Diff: 1    Page Ref: 122

14) The reason that the nail bed appears pink is the presence of a large number of melanocytes in the underlying dermis.
    Answer: FALSE
    Diff: 1    Page Ref: 122

15) Joe just burned his hand on a hot pot. A blister forms and the burn is painful; Joe’s burn would best be described as a third-degree burn.
    Answer: FALSE
    Diff: 1    Page Ref: 124
16) The nail is actually a modification of the skin and corresponds to the hooves of animals.
   Answer: TRUE
   Diff: 1   Page Ref: 122

17) The downy type of hair covering a newborn is called vernix caseosa.
   Answer: FALSE
   Diff: 2   Page Ref: 127

18) The ABCD rule is used for classifying burns.
   Answer: FALSE
   Diff: 2   Page Ref: 126

19) In first-degree burns, only the epidermis is damaged.
   Answer: TRUE
   Diff: 2   Page Ref: 124

20) Squamous cell carcinoma arises from cells of the stratum spinosum.
   Answer: TRUE
   Diff: 1   Page Ref: 126
Matching

Match the following:

1) Acne
Diff: 1 Page Ref: 119
   A) full-thickness burn
   B) overproduction of skin cells causing dry, silvery scales

2) Cold sores
Diff: 2 Page Ref: 123
   C) cancer of skin pigment cells

3) Psoriasis
Diff: 2 Page Ref: 123
   D) staphylococcus bacterial infection causing water-filled lesions around the mouth and nose

4) Athlete’s foot
Diff: 1 Page Ref: 123
   E) bedsores

5) Basal cell carcinoma
Diff: 2 Page Ref: 125-126
6) Malignant melanoma
Diff: 2 Page Ref: 126
   F) partial-thickness burn
   G) fungus infection between toes
   H) hair thinning and some degree of baldness

7) Third-degree burns
Diff: 2 Page Ref: 124
   I) infection of the sebaceous glands accompanied by skin pimples

8) Seborrhea
Diff: 2 Page Ref: 119
   J) overactivity of sebaceous glands that results in dandruff

9) Impetigo
Diff: 2 Page Ref: 123
   K) fluid-filled blisters caused by herpes simplex virus

10) Alopecia
Diff: 2 Page Ref: 127
   L) malignancy of the lowest epidermal layer

11) Decubitus ulcers
Diff: 2 Page Ref: 118

1) I    2) K    3) B    4) G    5) L    6) C
Match the following:

12) Papillary layer
   Diff: 2
   Page Ref: 117

13) Hair root
   Diff: 2
   Page Ref: 121

14) Matrix
   Diff: 2
   Page Ref: 121

15) Medulla
   Diff: 2
   Page Ref: 121

16) Apocrine gland
   Diff: 2
   Page Ref: 120

17) Eccrine gland
   Diff: 2
   Page Ref: 119-120

18) Dermal sheath
   Diff: 2
   Page Ref: 121

A) outermost covering of the hair follicle
B) part of the hair projecting from the skin surface
C) part of the hair enclosed in the follicle
D) central core of each hair
E) sudoriferous glands largely confined to the axillary region
F) divides to form hair cells
G) upper layer of the dermis
H) lower layer of the dermis
I) sudoriferous glands found all over the body

18) A
Match the following:

19) Type of membrane that is dry
   Diff: 1    Page Ref: 110
   A) serous membrane
   B) mucous membrane

20) Type of membrane adapted for absorption or secretion
   Diff: 2    Page Ref: 110
   C) cutaneous membrane
   D) synovial membrane

21) Type of membrane that has no epithelial cells at all
   Diff: 1    Page Ref: 112

22) Type of membrane that contains a visceral and a partietal layer
   Diff: 2    Page Ref: 112

23) Only example of a connective tissue membrane
   Diff: 1    Page Ref: 112

24) Type of membrane that lines open body cavities
   Diff: 1    Page Ref: 110

25) Peritoneum, pericardium, and pleura are examples of this type of membrane
   Diff: 1    Page Ref: 112


Essay

1) Explain the ABCD rule.
   Answer: The ABCD rule describes the appearance of the most serious form of skin cancer, melanoma. The "A" is for asymmetry. In melanoma, the two sides of the pigmented spot or mole do not match. The "B" is for border irregularity. In melanoma, the borders of the lesion are not smooth but exhibit indentations. The "C" is for color. In melanoma, the pigmented spot contains areas of different colors (blacks, browns, tans, and sometimes blues and reds). The "D" is for diameter. In melanoma, the spot is larger than 6 mm in diameter (the size of a pencil eraser).

   Diff: 3    Page Ref: 126
2) Distinguish between the appearances of partial-thickness and full-thickness burns.

Answer: Partial thickness burns are burns that don’t completely damage both layers of skin, and include first- and second-degree burns. In first-degree burns only the epidermis is damaged, with redness and swelling and some pain. These burns typically heal in two to three days without special attention. Second-degree burns involve injury to the epidermis and upper region of the dermis. They are characterized by redness, blisters, and pain. Ordinarily, no permanent scars result if care is taken to prevent infection. Full-thickness burns destroy the entire thickness of skin and are also termed third-degree burns. In third-degree burns, the burned area appears blanched (gray-white) or blackened. The burned area is not painful since nerve endings in the area are destroyed. Regeneration is not possible, therefore skin grafting must be done to cover underlying exposed tissues.

Diff: 2 Page Ref: 123-125

3) Explain how the skin helps regulate body temperature.

Answer: The nervous system is responsible for controlling all temperature-regulating functions of the skin. When the temperature in the external environment is high, heat loss occurs as the nervous system activates sweat glands. Perspiration is produced, which evaporates from the skin surface, causing heat to be dissipated. At the same time, the nervous system causes blood to be flushed into skin capillary beds so that heat radiates from the body surface. In contrast, when the temperature in the external environment is low, the nervous system prevents blood from entering the skin capillary system and radiation to the body exterior is prevented so that perspiration does not occur. At the same time, blood is prevented from entering deeper tissues and the core temperature of the body is maintained.

Diff: 3 Page Ref: 118; 120

4) Define and explain the function of the arrector pili.

Answer: The arrector pili are small bands of smooth muscle cells that connect each side of a hair follicle to the dermal tissue. They are activated by cold or fright and, when contracted, pull the hair follicle into an upright position, dimpling the skin surface with "goose bumps."

Diff: 1 Page Ref: 122

5) Identify four changes that occur to the skin and subcutaneous connective tissue as a result of aging, and state how these changes can be delayed.

Answer: 1. The amount of subcutaneous tissue below the skin decreases, leading to an intolerance to cold in the elderly.
2. Because of decreased oil production and declining numbers of collagen fibers, the skin becomes drier and may become itchy and bothersome.
3. Thinning of the skin makes it more susceptible to bruising and other types of injuries.
4. A decrease in elasticity of the skin, along with the loss of subcutaneous fat, allows bags to form under the eyes and causes jowls to sag.

To delay these changes, the skin should be kept clean and shielded from the sun, and a healthy diet with plenty of fluids should be maintained.

Diff: 3 Page Ref: 127
6) List and describe the three types of epithelial membranes.

Answer: 1. Cutaneous membrane is:
   a. skin
   b. dry
   c. composed of keratinizing stratified squamous epithelium and the underlying connective tissue is often dense and fibrous.

2. Mucous membrane:
   a. is moist
   b. is found lining all body cavities that open to the exterior
   c. often contains stratified squamous epithelium or simple columnar epithelium

3. Serous membrane:
   a. is composed of two layers (visceral layer covers the organ in the cavity while the parietal layer lines a specific portion of the wall of the ventral body cavity)
   b. covers organs in body cavities that are closed to the exterior
   c. is constructed of simple squamous epithelium overlying a thin layer of areolar connective tissue

Diff: 2  Page Ref: 110-112

7) Explain how the skin functions to protect deeper tissues.

Answer: Skin contains:

1. keratin which toughens cells and serves as a barrier to mechanical damage and chemical damage; keratin also serves to waterproof the skin to prevent desiccation
2. acidic oily secretions that prevent bacterial damage
3. melanin to protect from UV damage
4. receptors to detect heat, cold, and pain; serves as a protection against thermal damage

Diff: 2  Page Ref: 115-119

8) Thirteen-year-old John has been diagnosed with acne. Explain to him what causes acne.

Answer: Acne is an active infection of the sebaceous glands accompanied by pimples on the skin. Sebaceous glands release sebum, or oil, onto the skin's surface.

Diff: 1  Page Ref: 119