Multiple-Choice Questions

1) Which of the following is the correct order of the layers of the cutaneous membrane?
   A) epidermis, hypodermis, dermis
   B) dermis, epidermis, hypodermis
   C) epidermis, dermis, hypodermis
   D) hypodermis, dermis, epidermis
   E) dermis, hypodermis, dermis
   Answer: C
   Diff: 1
   Learning Outcome: 5-1
   Skill Level: 1 Reviewing Facts and Terms

2) The tissue under the skin is called the
   A) epidermis or dermis.
   B) epidermis or subcutaneous layer.
   C) hypodermis or subcutaneous layer.
   D) integument or dermis.
   E) epidermis or superficial fascia.
   Answer: C
   Diff: 1
   Learning Outcome: 5-1
   Skill Level: 1 Reviewing Facts and Terms

3) As cells are pushed from the deeper portion of the epidermis toward the surface,
   A) they divide.
   B) they die.
   C) their nutrient supply increases.
   D) they enter the dermis.
   E) all of the above
   Answer: B
   Diff: 1
   Learning Outcome: 5-1
   Skill Level: 1 Reviewing Facts and Terms
4) The layer of the epidermis at the surface is the
   A) stratum corneum.
   B) stratum lucidum.
   C) stratum germinativum.
   D) stratum granulosum.
   E) stratum spinosum.
   Answer: A
   Diff: 1
   Learning Outcome: 5-1
   Skill Level: 1 Reviewing Facts and Terms

5) Thick skin can be found on the
   A) back.
   B) palms.
   C) legs.
   D) arms.
   E) chest.
   Answer: B
   Diff: 1
   Learning Outcome: 5-1
   Skill Level: 1 Reviewing Facts and Terms

6) The skin is also called the
   A) serous membrane.
   B) mucous membrane.
   C) synovial membrane.
   D) cutaneous membrane.
   E) none of the above
   Answer: D
   Diff: 1
   Learning Outcome: 5-1
   Skill Level: 1 Reviewing Facts and Terms

7) Thin skin is defined by the thickness of the
   A) dermis.
   B) epidermis.
   C) hypodermis.
   D) subcutaneous layer.
   E) melanin.
   Answer: B
   Diff: 1
   Learning Outcome: 5-1
   Skill Level: 1 Reviewing Facts and Terms
8) An epidermal layer that produces large amounts of keratin is the
A) stratum corneum.
B) stratum lucidum.
C) stratum germinativum.
D) stratum granulosum.
E) stratum spinosum.
Answer: D
Diff: 1
Learning Outcome: 5-1
Skill Level: 1 Reviewing Facts and Terms

9) The primary mode of heat loss from the body is
A) radiation.
B) conduction.
C) convection.
D) evaporation.
E) none of the above
Answer: A
Diff: 2
Learning Outcome: 5-1
Skill Level: 1 Reviewing Facts and Terms

10) In order for bacteria on the skin to cause an infection in the skin, they must
A) survive the bactericidal components of sebum.
B) avoid being flushed from the surface of the skin by sweat.
C) penetrate the stratum corneum.
D) escape the Langerhans' cells.
E) all of the above
Answer: E
Diff: 1
Learning Outcome: 5-1
Skill Level: 1 Reviewing Facts and Terms

11) Epidermal cells are supplied with nutrients from blood vessels in the
A) dermis.
B) epidermis.
C) hypodermis.
D) both A and B above
E) all of the above
Answer: A
Diff: 1
Learning Outcome: 5-1
Skill Level: 1 Reviewing Facts and Terms
12) Drugs suspended in ________ or ________ can penetrate the epidermis.
A) water; blood
B) water; lipids
C) oils; alcohol
D) oils; lipid-soluble carriers
E) sebum; water
Answer: D
Diff: 1
Learning Outcome: 5-1
Skill Level: 2 Reviewing Concepts

13) Functions of the skin include
A) regulating body temperature.
B) synthesizing antibodies.
C) producing adipose tissue.
D) synthesizing digestive enzymes.
E) release of large amounts of hormones.
Answer: A
Diff: 1
Learning Outcome: 5-1
Skill Level: 1 Reviewing Facts and Terms

14) An individual with excessive epidermal shedding on the scalp may be prone to develop this condition.
A) seborrhea
B) dermatitis
C) acne
D) dandruff
E) psoriasis
Answer: D
Diff: 1
Learning Outcome: 5-1
Skill Level: 1 Reviewing Facts and Terms

15) In albinism, ________ is lacking.
A) melanin
B) keratin
C) carotene
D) keratinocytes
E) collagen
Answer: A
Diff: 1
Learning Outcome: 5-2
Skill Level: 1 Reviewing Facts and Terms
16) The skin may turn orange as a result of ________ buildup.
A) melanin
B) keratin
C) carotene
D) biliverdin
E) bilirubin
Answer: A
Diff: 1
Learning Outcome: 5-2
Skill Level: 1 Reviewing Facts and Terms

17) The pigment melanin
A) is produced by cells called melanocytes and is found in higher concentration in individuals with
darker skin.
B) is usually some shade of red, yellow, or brown.
C) protects DNA from the damaging effects of UV radiation.
D) A and C only
E) all of the above
Answer: D
Diff: 1
Learning Outcome: 5-2
Skill Level: 1 Reviewing Facts and Terms

18) The most important factor in skin color is
A) sunlight exposure.
B) dermal blood supply.
C) diet.
D) number of keratinocytes.
E) genetic factors.
Answer: E
Diff: 1
Learning Outcome: 5-2
Skill Level: 1 Reviewing Facts and Terms

19) Exposure of the skin to ultraviolet light
A) can result in increased numbers of melanocytes forming in the skin.
B) can result in decreased melanin production by melanocytes.
C) can cause destruction of vitamin D.
D) can stimulate the production of melanin.
E) has no effect on the skin cells.
Answer: D
Diff: 2
Learning Outcome: 5-2
Skill Level: 1 Reviewing Facts and Terms
20) When a person becomes "pale," what is the physiologic basis?
A) The blood supply to the skin increases.
B) The number of red melanocytes in the skin increases.
C) Melanocytes increase production of red pigments.
D) The blood supply to the skin decreases.
E) Increased heat causes the skin to turn red.
Answer: D
Diff: 1
Learning Outcome: 5-2
Skill Level: 2 Reviewing Concepts

21) Which of the following is a function of the integumentary system that aids the endocrine system?
A) protection of underlying tissue
B) excretion
C) maintenance of body temperature
D) synthesis of vitamin D
E) nutrition and storage
Answer: D
Diff: 1
Learning Outcome: 5-3
Skill Level: 1 Reviewing Facts and Terms

22) Epidermal cells synthesize this vitamin when exposed to sunlight.
A) vitamin D2
B) vitamin C
C) vitamin E
D) vitamin D3
E) vitamin A
Answer: D
Diff: 1
Learning Outcome: 5-3
Skill Level: 1 Reviewing Facts and Terms

23) The dermis is composed largely of
A) adipose tissue.
B) blood vessels.
C) dense irregular connective tissue.
D) muscle tissue.
E) neural tissue.
Answer: C
Diff: 1
Learning Outcome: 5-4
Skill Level: 1 Reviewing Facts and Terms
24) When smooth muscles in the walls of dermal blood vessels contract,
A) the vessels’ lumen enlarge.
B) more blood enters the dermis.
C) blood is forced to the epidermis.
D) body heat is conserved.
E) more heat is lost.
Answer: D
Diff: 1
Learning Outcome: 5-4
Skill Level: 1 Reviewing Facts and Terms

25) The layer of the skin that provides thermoregulation via changing blood flow is the
A) dermis.
B) subcutaneous layer.
C) epidermis.
D) papillary layer.
E) sebum layer.
Answer: A
Diff: 1
Learning Outcome: 5-4
Skill Level: 1 Reviewing Facts and Terms

26) Folds of the dermis that cause fingerprints are called
A) arrector pili.
B) dermal ridges.
C) dermal papillae.
D) cuticles.
E) the papillary layer of the dermis.
Answer: C
Diff: 1
Learning Outcome: 5-4
Skill Level: 1 Reviewing Facts and Terms

27) Nerve fibers in the skin are associated with
A) smooth muscles.
B) blood vessels.
C) sensory nerve endings.
D) hair follicles.
E) all of the above
Answer: E
Diff: 1
Learning Outcome: 5-4
Skill Level: 1 Reviewing Facts and Terms
28) When the body is overheated, the skin responds by
A) decreasing melanin production.
B) increasing heart rate.
C) decreasing blood flow to the dermis.
D) increasing blood flow to the dermis.
E) increasing keratin production.
Answer: D
Diff: 1
Learning Outcome: 5-4
Skill Level: 2 Reviewing Concepts

29) The subcutaneous layer is made of
A) epithelial tissue.
B) loose connective and adipose tissues.
C) dense connective and loose connective tissues.
D) epithelium and loose connective tissues.
E) skeletal muscles and adipose tissue.
Answer: B
Diff: 1
Learning Outcome: 5-5
Skill Level: 1 Reviewing Facts and Terms

30) The hypodermis contains mostly
A) loose connective tissue.
B) adipose tissue.
C) muscle tissue.
D) nervous tissue.
E) epithelial tissue.
Answer: B
Diff: 1
Learning Outcome: 5-5
Skill Level: 1 Reviewing Facts and Terms

31) Injections made under the skin are called
A) epidermal injections.
B) subcutaneous injections.
C) dermal injections.
D) hypodermal injections.
E) intramuscular injections.
Answer: D
Diff: 1
Learning Outcome: 5-5
Skill Level: 1 Reviewing Facts and Terms
32) Shafts of hair are made by
A) living dermal cells.
B) dead dermal cells.
C) adipose cells.
D) living epidermal cells.
E) dead epidermal cells.
Answer: E
Diff: 1
Learning Outcome: 5-6
Skill Level: 1 Reviewing Facts and Terms

33) When the arrector pili muscles contract,
A) "goose bumps" are formed.
B) hairs are shed.
C) sweat is released from sweat glands.
D) shivering occurs.
E) the skin changes color.
Answer: A
Diff: 1
Learning Outcome: 5-6
Skill Level: 1 Reviewing Facts and Terms

34) Accessory structures of the skin include
A) hair follicles.
B) arrector pili muscles.
C) sebaceous glands.
D) apocrine sweat glands.
E) all of the above
Answer: E
Diff: 1
Learning Outcome: 5-6
Skill Level: 1 Reviewing Facts and Terms

35) Temporary increases in hair loss can result from
A) drugs.
B) dietary factors.
C) radiation.
D) fever.
E) all of the above
Answer: E
Diff: 1
Learning Outcome: 5-6
Skill Level: 1 Reviewing Facts and Terms
36) Glands that are located in the ear canal are called
A) ceruminous glands.
B) apocrine sweat glands.
C) sebaceous glands.
D) merocrine sweat glands.
E) mammary glands.
Answer: A
Diff: 1
Learning Outcome: 5-7
Skill Level: 1 Reviewing Facts and Terms

37) Perspiration produced by apocrine sweat glands
A) is more than 99 percent water.
B) contains electrolytes and waste products.
C) helps to cool the body when it evaporates.
D) is limited to the hair follicles of the axilla, nipples, and groin.
E) all of the above
Answer: D
Diff: 1
Learning Outcome: 5-7
Skill Level: 1 Reviewing Facts and Terms

38) The condition that results from clogged sebaceous glands is
A) a boil.
B) a carbuncle.
C) acne.
D) a blister.
E) none of the above
Answer: C
Diff: 1
Learning Outcome: 5-7
Skill Level: 1 Reviewing Facts and Terms

39) Eccrine sweat glands
A) are most common in the axilla and groin.
B) respond primarily to elevated body temperature.
C) respond only in times of stress.
D) are active only in areas of dense hair.
E) all of the above
Answer: B
Diff: 1
Learning Outcome: 5-7
Skill Level: 1 Reviewing Facts and Terms
40) Sweat helps to cool the body by
A) conduction.
B) evaporation.
C) convection.
D) radiation.
E) all of the above
Answer: B
Diff: 1
Learning Outcome: 5-7
Skill Level: 1 Reviewing Facts and Terms

41) Eccrine and sebaceous glands differ in
A) type of secretion.
B) material secreted.
C) location in the body.
D) their association with hair follicles.
E) all of the above
Answer: E
Diff: 1
Learning Outcome: 5-7
Skill Level: 1 Reviewing Facts and Terms

42) The glands that develop at puberty are
A) sweat glands.
B) integumentary glands.
C) apocrine glands.
D) dermal glands.
E) merocrine glands.
Answer: C
Diff: 1
Learning Outcome: 5-7
Skill Level: 1 Reviewing Facts and Terms

43) Specialized sweat glands that produce milk are called
A) ceruminous glands.
B) apocrine sweat glands.
C) sebaceous glands.
D) merocrine sweat glands.
E) mammary glands.
Answer: E
Diff: 1
Learning Outcome: 5-7
Skill Level: 1 Reviewing Facts and Terms
44) The pale crescent area of the nail is called the
A) nail root.
B) nail bed.
C) lunula.
D) free edge.
E) cuticle.
Answer: C
Diff: 1
Learning Outcome: 5-8
Skill Level: 1 Reviewing Facts and Terms

45) The fold of stratum corneum over the base of a nail is called the
A) body.
B) bed.
C) root.
D) cuticle.
E) free edge.
Answer: D
Diff: 1
Learning Outcome: 5-8
Skill Level: 1 Reviewing Facts and Terms

46) A "rug burn" is an example of a(n)
A) abrasion.
B) laceration.
C) puncture.
D) incision.
E) contusion.
Answer: A
Diff: 1
Learning Outcome: 5-9
Skill Level: 1 Reviewing Facts and Terms

47) The type of burn that may require a skin graft is a
A) first-degree burn.
B) second-degree burn.
C) third-degree burn.
D) partial-thickness burn.
E) semi-partial-thickness burn.
Answer: C
Diff: 1
Learning Outcome: 5-9
Skill Level: 1 Reviewing Facts and Terms
48) A burn that penetrates the epidermis and part of the dermis is classified as a
A) first-degree burn.
B) second-degree burn.
C) third-degree burn.
D) fourth-degree burn.
E) fifth-degree burn.
Answer: B
Diff: 1
Learning Outcome: 5-9
Skill Level: 1 Reviewing Facts and Terms

49) Why would an elderly person be more prone to skin infections than a younger person?
A) Skin repairs take longer in the elderly.
B) The epidermis is thinner in the elderly.
C) There are fewer macrophages in the skin of the elderly.
D) The blood supply to the dermis is reduced in the skin of the elderly.
E) all of the above
Answer: E
Diff: 1
Learning Outcome: 5-10
Skill Level: 1 Reviewing Facts and Terms

50) A burn that involves only the epidermis, such as a mild sunburn, is classified as
A) first degree.
B) second degree.
C) third degree.
D) fourth degree.
E) a permanent-damage burn.
Answer: A
Diff: 1
Learning Outcome: 5-9
Skill Level: 1 Reviewing Facts and Terms

51) This type of burn appears inflamed and tender but has no blisters.
A) first-degree burn
B) second-degree burn
C) third-degree burn
D) full-thickness burn
E) none of the above
Answer: A
Diff: 1
Learning Outcome: 5-9
Skill Level: 1 Reviewing Facts and Terms
52) The most severe type of skin cancer is most likely to develop from
A) nonpigmented epithelial cells.
B) melanocytes.
C) pigmented epithelial cells.
D) nonpigmented dermal cells.
E) the hypodermis.
Answer: B
Diff: 1
Learning Outcome: 5-10
Skill Level: 1 Reviewing Facts and Terms

Fill in the Blank Questions

1) The deepest layer of cells in the epidermis is the cells of the stratum

Answer: germinativum (basale)
Diff: 1
Learning Outcome: 5-1
Skill Level: 1 Reviewing Facts and Terms

2) The substance that gives the skin its waterproofing ability is _________________________.
Answer: keratin
Diff: 1
Learning Outcome: 5-1
Skill Level: 1 Reviewing Facts and Terms

3) The protein that contributes to many of the skin's protective qualities is called

Answer: keratin
Diff: 1
Learning Outcome: 5-1
Skill Level: 1 Reviewing Facts and Terms

4) _________________________ is a pigment found in vegetables that can make skin appear
orange or yellow.
Answer: Carotene
Diff: 1
Learning Outcome: 5-2
Skill Level: 1 Reviewing Facts and Terms

5) Melanin serves to protect cells under the epidermis from _________________________.
Answer: UV light
Diff: 1
Learning Outcome: 5-2
Skill Level: 1 Reviewing Facts and Terms
6) Exposure to _________________________ radiation from the sun has the effect of increasing melanin production in the skin.
   Answer: ultraviolet (UV)
   Diff: 1
   Learning Outcome: 5-2
   Skill Level: 1 Reviewing Facts and Terms

7) The _________________________ layer of the skin contains bundles of collagen fibers and elastin and is responsible for the strength of the skin.
   Answer: reticular
   Diff: 1
   Learning Outcome: 5-4
   Skill Level: 1 Reviewing Facts and Terms

8) Body temperature normally remains close to _________________________ degrees Fahrenheit.
   Answer: 98.6
   Diff: 1
   Learning Outcome: 5-4
   Skill Level: 1 Reviewing Facts and Terms

9) The thermostat for the body is the _________________________.
   Answer: hypothalamus
   Diff: 1
   Learning Outcome: 5-4
   Skill Level: 1 Reviewing Facts and Terms

10) The _________________________ glands function as scent glands.
    Answer: apocrine
    Diff: 1
    Learning Outcome: 5-7
    Skill Level: 1 Reviewing Facts and Terms

11) The nail _________________________ covers the nail bed.
    Answer: body
    Diff: 1
    Learning Outcome: 5-8
    Skill Level: 1 Reviewing Facts and Terms

12) A thickened area of scar tissue that is covered by a shiny, smooth epidermal surface is called a(n) _________________________.
    Answer: keloid
    Diff: 1
    Learning Outcome: 5-9
    Skill Level: 1 Reviewing Facts and Terms
13) ___________________________ are accumulations of fluid within the epidermis or between the epidermis and the dermis.
Answer: Blisters
Diff: 1
Learning Outcome: 5-9
Skill Level: 1 Reviewing Facts and Terms

Essay Questions

1) Many medications can be administered transdermally by applying patches that contain the medication to the surface of the skin. These patches can be attached anywhere on the skin except the palms of the hands and the soles of the feet. Why?
Answer: The palms of the hands and the soles of the feet have an extra layer in the epidermis, the stratum lucidum. The presence of this extra layer slows down the rate of diffusion of the medication and significantly decreases its effectiveness.
Diff: 2
Learning Outcome: 5-1
Skill Level: 2 Reviewing Concepts

2) In a condition known as sunstroke, the victim appears flushed, the skin is warm and dry, and the body temperature rises dramatically. Explain these observations based on what you know concerning the role of the skin in thermoregulation.
Answer: When the body temperature increases, more blood flow is directed to the vessels of the skin. The red pigment in the blood gives the skin a redder than usual color and accounts for the victim's flushed appearance. The skin is dry because the sweat glands are not producing sweat (to avoid further dehydration). Without evaporative cooling, not enough heat is dissipated from the skin, the skin is warm, and the body temperature rises.
Diff: 1
Learning Outcome: 5-2
Skill Level: 2 Reviewing Concepts

3) Two patients are brought to the emergency room. One has cut his finger with a knife; the other has stepped on a nail. Which wound has a greater chance of becoming infected? Why?
Answer: The puncture wound has a greater chance of becoming infected than the knife cut because the cut from the knife will bleed freely, washing away many of the bacteria from the wound site. In a puncture wound, bacteria can be forced beneath the surface of the skin and past the skin's protective barriers, thus increasing the possibility of infection.
Diff: 2
Learning Outcome: 5-9
Skill Level: 3 Critical Thinking & Clinical Applications
Labeling Exercises

Using the figure above, identify the labeled part.

1) Label A: __________
   Answer: Epidermis
   Diff: 1
   Learning Outcome: 5-1
   Skill Level: 1 Reviewing Facts and Terms

2) Label B: __________
   Answer: Dermis
   Diff: 1
   Learning Outcome: 5-1
   Skill Level: 1 Reviewing Facts and Terms

3) Label C: __________
   Answer: Subcutaneous layer
   Diff: 1
   Learning Outcome: 5-1
Skill Level: 1 Reviewing Facts and Terms

4) Label D: ________
Answer: Fat
Diff: 1
Learning Outcome: 5-1
Skill Level: 1 Reviewing Facts and Terms

5) Label E: ________
Answer: Nerve fibers
Diff: 1
Learning Outcome: 5-1
Skill Level: 1 Reviewing Facts and Terms

6) Label F: ________
Answer: Sweat gland
Diff: 1
Learning Outcome: 5-1
Skill Level: 1 Reviewing Facts and Terms

7) Label G: ________
Answer: Vein
Diff: 1
Learning Outcome: 5-1
Skill Level: 1 Reviewing Facts and Terms

8) Label H: ________
Answer: Artery
Diff: 1
Learning Outcome: 5-1
Skill Level: 1 Reviewing Facts and Terms

9) Label I: ________
Answer: Hair follicle
Diff: 1
Learning Outcome: 5-1
Skill Level: 1 Reviewing Facts and Terms

10) Label J: ________
Answer: Touch and pressure receptors
Diff: 1
Learning Outcome: 5-1
Skill Level: 1 Reviewing Facts and Terms

11) Label K: ________
Answer: Sweat gland duct
Diff: 1
Learning Outcome: 5-1
Skill Level: 1 Reviewing Facts and Terms

12) Label L: __________
   Answer: Arrector pili muscle
   Diff: 1
   Learning Outcome: 5-1
   Skill Level: 1 Reviewing Facts and Terms

13) Label M: __________
   Answer: Sebaceous gland
   Diff: 1
   Learning Outcome: 5-1
   Skill Level: 1 Reviewing Facts and Terms

14) Label N: __________
   Answer: Dermal papilla
   Diff: 1
   Learning Outcome: 5-1
   Skill Level: 1 Reviewing Facts and Terms

15) Label O: __________
   Answer: Epidermal ridge
   Diff: 1
   Learning Outcome: 5-1
   Skill Level: 1 Reviewing Facts and Terms

16) Label P: __________
   Answer: Pore of sweat gland duct
   Diff: 1
   Learning Outcome: 5-1
   Skill Level: 1 Reviewing Facts and Terms

17) Label Q: __________
   Answer: Hair shaft
   Diff: 1
   Learning Outcome: 5-1
   Skill Level: 1 Reviewing Facts and Terms