1. The contraction of the piloerector muscles (pilomotor muscle or arrector pili) in *humans* causes
   A. hairs to stand on end to make the individual appear bigger.
   B. generation of heat to raise the body temperature.
   C. hairs to stand on end with no apparent function.
   D. increased ability to feel pain.
   E. hairs to stand on end trapping an insulating layer of warm air next to the skin.

2. Which of the following types of cells are NOT found in the epidermis?
   A. Melanocytes
   B. Squamous epithelial cells
   C. Red blood cells
   D. Langerhans cells
   E. None of these

3. Skin color is the result of the
   A. number of keratinocytes in the skin.
   B. thickness of the stratum basale.
   C. quantity of melanin in the skin.
   D. number of melanocytes in the skin.
   E. amount of fat in the subcutaneous tissue.

4. A yellow pigment derived from plants that can impart a yellow color to the skin is
   A. melanosomes.
   B. dermatitis.
   C. cyanosis.
   D. carotene.
   E. albinism.

5. Acne is caused or exacerbated by…
   A. abnormal keratinization of hair follicles.
   B. *Propionibacterium*.
   C. sebum.
   D. testosterone.
   E. all of these are factors.

6. A subcutaneous injection delivers medication into the
   A. muscle.
   B. hypodermis.
   C. joint.
   D. dermis.
   E. epidermis

7. The portion of a hair that protrudes above the surface of the skin is the
   A. dermal papilla.
   B. hair root.
   C. hair bulb.
   D. hair shaft.
   E. hair follicle.

8. Which of the following will help cool the body?
   A. absorption of ultraviolet light rays by the skin
   B. evaporation of sweat from the skin's surface
   C. absorption of excess sweat
   D. contraction of the arrector pili muscles
   E. decreased blood flow to the skin
9. Leather is mostly made of the ________ layer of the dermis, which is very tough due to the high concentration of ________ fibers.
A. areolar; collagen  
B. papillary; keratin  
C. reticular; collagen  
D. reticular; keratin  
E. areolar; keratin

10. Barney sat on a hot camp stove while on a camping trip. The burn was painful and blistered. His was what type of burn?
A. fifth degree  
B. first degree  
C. second degree  
D. third degree  
E. fourth degree

11. Which of the following functions is associated with the skin?
A. protection against ultraviolet radiation of the sun  
B. vitamin A production  
C. fat production  
D. regulation of body pH  
E. vitamin C production

12. Which of the following represents the correct order of the layers of the epidermis from the deepest to the most superficial?
A. stratum corneum, stratum lucidum, stratum granulosum, stratum spinosum, stratum basale  
B. stratum lucidum, stratum granulosum, stratum corneum, stratum basale, and stratum spinosum  
C. stratum basale, stratum spinosum, stratum granulosum, stratum lucidum, and stratum corneum  
D. stratum spinosum, stratum basale, stratum lucidum, stratum corneum, and stratum granulosum  
E. stratum basale, stratum granulosum, stratum lucidum, stratum spinosum, and stratum corneum

13. Fingerprints and footprints are produced by ridge-like projections into the epidermis called
A. cleavage lines.  
B. reticular lines.  
C. melanocytes  
D. dermal papillae.  
E. dermal striae.

14. Eccrine/merocrine sweat glands
A. produce a secretion that protects the body from growth of bacteria.  
B. produce a secretion that oils the hair and skin.  
C. serve as "anchors" for the arrector pili muscles.  
D. aid in cooling the body.  
E. are not involved in the homeostasis of body temperature.

15. When the arrector pili muscles contract
A. the hair on your arms and legs begins to curl.  
B. no change is noted on the skin surface.  
C. the body is able to lose heat.  
D. the sweat glands empty their contents onto the surface of the skin.  
E. "goose bumps" form on the skin.

16. The hypodermis usually has an abundance of this tissue.
A. keratinized tissue  
B. muscular tissue  
C. adipose tissue  
D. nervous tissue  
E. epithelial tissue
17. Which of the following statements concerning the subcutaneous tissue is false?
A. The main cell types of the subcutaneous tissue are fibroblasts, fat cells, and macrophages.
B. The subcutaneous tissue attaches the skin to underlying bone and muscle.
C. Subcutaneous tissue is primarily composed of dense connective tissue with collagen and elastin fibers.
D. Subcutaneous tissue is referred to as superficial fascia.
E. The subcutaneous tissue is a site of fat storage.

18. Which cells of the epidermis are part of the immune system?
A. fibroblasts C. melanocytes E. keratinocytes
B. Merkel cells D. Langerhans cells

19. The reddish color of the skin of the lips is primarily due to this pigment.
A. myoglobin C. keratin E. hemoglobin
B. carotene D. melanin

20. The nail root and the nail body attach to the
A. lunula. C. nail bed E. subcutaneous tissue.
B. nail groove. D. hyponychium.

21. Delicate unpigmented hairs that cover the fetus in early development are called
A. primary hairs. C. lanugo hairs. E. vellus hairs.
B. terminal hairs. D. secondary hairs.

22. Which vitamin begins its synthesis in the skin exposed to ultraviolet light?
A. vitamin A C. vitamin C E. vitamin E
B. vitamin B D. vitamin D

23. An expanded knob at the base of the hair root is the
A. shaft. C. hair bulb E. cuticle.
B. medulla. D. root.

24. With aging, individuals tend to feel colder and usually need the thermostat in their home set higher in the winter to feel warm enough. This is probably because the elderly
A. no longer experience hot flashes at night.
B. exhibit a decrease in melanin production.
C. have less blood flowing to the skin.
D. have an increase in desquamation.
E. experience a decrease in the thickness of their subcutaneous fat layer.

25. Vitamin C is essential for normal collagen synthesis. If a child suffered from a vitamin C deficiency, which layer of the skin would be most affected?
A. reticular layer of dermis C. stratum basale E. stratum corneum
B. stratum granulosum D. epidermis

26. The layer of the epidermis in which there is the greatest amount of mitotic activity.
A. stratum basale C. stratum corneum E. stratum granulosum
B. stratum lucidum D. stratum spinosum
27. The dermis
   A. is divided into three distinct layers.
   B. contains no blood vessels.
   C. functions as padding and insulation.
   D. does not contain connective tissue.
   E. is responsible for most of the skin's structural strength.

28. What protein is found in the nails, hair, and epidermis?
   A. carotene  
   B. melanin  
   C. elastin  
   D. keratin  
   E. collagen

29. The outer surface of the hair is called the
   A. cuticle.  
   B. shaft.  
   C. hair bulb.  
   D. root.  
   E. medulla.

30. Nail cells are produced by the
   A. nail matrix.  
   B. nail groove.  
   C. nail body.  
   D. lunula.  
   E. cuticle.

31. Bilirubin causes a skin discoloration called
   A. pallor.  
   B. jaundice.  
   C. erythema.  
   D. bronzing.  
   E. cyanosis.

32. Which of the following statements concerning the epidermis is true?
   A. The epidermis is very permeable to water-soluble molecules.
   B. The dermis is superficial to the epidermis.
   C. The epidermis contains numerous blood vessels.
   D. The epidermis is nourished by blood vessels located in the dermis.
   E. The most numerous cells in the epidermis are the melanocytes.

33. Which type of skin cancer is the most deadly?
   A. melanoma  
   B. basal cell carcinoma  
   C. squamous cell carcinoma  
   D. psoriasis  
   E. Kaposi's sarcoma

34. What type of skin gland secretes earwax?
   A. Eccrine sweat gland  
   B. Apocrine sweat gland  
   C. Sebaceous gland  
   D. Ceruminous gland  
   E. None of these

35. Eskimos wear a great deal of clothing and have limited exposure to U.V. light, but do not suffer from vitamin D deficiency. A possible explanation is,
   A. they do not need vitamin D.
   B. their exposure to U.V. light in the summer will last for a year.
   C. they do not require sunlight for vitamin D formation.
   D. their bodies produce vitamin D another way.
   E. they get enough vitamin D in their diet of fish and marine mammals.
36. Blood vessels in the _________ provide a hair with its sole source of nutrition.
   A. bulb  B. medulla  C. dermal papilla  D. shaft  E. root

37. This is the main fibrous layer of the dermis.
   A. papillary layer  B. reticular layer  C. epidermis  D. subcutaneous tissue  E. stretch marks

38. The skin discoloration most likely to result from liver disease is

39. Which of the following prevents the skin from overstretching and gives it strength?
   A. Collagen fibers  B. Melanin  C. Adipose tissue  D. Elastic fibers  E. None of these

40. A pilus is
   A. a tiny muscle that moves a hair.  B. a hair.  C. a sensory nerve fiber around the base of a hair.  D. a gland associated with a hair follicle.  E. a hair follicle.

41. This is the dermal layer closest to the epidermis.
   A. stretch marks  B. epidermis  C. papillary layer  D. reticular layer  E. subcutaneous tissue

42. Stretch marks develop on the abdomen of pregnant women because of stretching and rupture of the

43. Striae indicate a predominance (more than random) of collagen fibers…
   A. running perpendicular to tension lines.  B. running haphazardly to tension lines.  C. running parallel to tension lines.  D. all of the above.  E. none of the above.

44. Baldness
   A. occurs only in men.  B. is related to estrogen levels.  C. is related to levels of growth hormone.  D. is more common in men than in women.  E. is not genetic.
45. Which of the following statements is true?
   A. The majority of hair on the chest is vellus hair.
   B. In males, the hairs of the beard are vellus hairs.
   C. Both vellus and terminal hairs are pigmented.
   D. Hair in the axillary region is vellus hair after puberty.
   E. At puberty, much of the vellus hair is replaced with terminal hair.

46. The most immediate threat to the life of a patient with severe burns is
   A. infection.
   B. pain.
   C. eschar.
   D. fluid loss.
   E. heat loss.

47. What percentage of a person's skin would be involved if they had burned their left arm, front of the trunk, and the front of their left leg?
   A. 40.5%
   B. 45%
   C. 31.5%
   D. 36%
   E. None of these

48. On coming inside from the cold, students notice that their cheeks are red. This results from
   A. constriction of the sweat glands in the cheeks.
   B. dilation of the blood vessels in the dermis of the cheeks.
   C. damage to the epidermis by the cold.
   D. increased permeability of superficial vessels.
   E. constriction of the blood vessels in the epidermis of the cheeks.

49. In which layer of the epidermis are granules of keratohyalin formed?
   A. stratum lucidum
   B. stratum corneum
   C. stratum spinosum
   D. stratum basale
   E. stratum granulosum

50. The bluish tinge of skin due to a reduction of oxygen in the blood is called
   A. desquamation.
   B. cyanosis.
   C. albinism.
   D. carotenosis.
   E. hemolysis.

51. A condition described by excessive body and facial hair in women is
   A. alopecia.
   B. hirsutism.
   C. decubitus ulcer.
   D. scabies.
   E. All of these

52. What happens to cells when they move from the epidermis to the surface of the skin?
   A. They die.
   B. They become dermal cells.
   C. They divide more.
   D. They obtain more nutrients.
   E. None of these

53. A slight sunburn is an example of a ____ burn.
   A. second-degree
   B. first-degree
   C. third-degree
   D. fourth-degree
   E. partial-thickness

54. A victim of an automobile accident goes into shock, which results in decreased blood flow. The victim's skin will
   A. become pale.
   B. not change color
   C. become bright red.
   D. develop a yellow tint.
   E. have a reddish hue.
55. The diagram illustrates glands of the skin. What does "D" represent?
   A. sweat pore
   B. eccrine sweat gland
   C. duct of apocrine sweat gland
   D. sebaceous gland
   E. apocrine sweat gland

56. The diagram illustrates glands of the skin. What does "E" represent?
   A. eccrine sweat gland
   B. apocrine sweat gland
   C. duct of apocrine sweat gland
   D. sebaceous gland
   E. sweat pore

57. The diagram illustrates glands of the skin. What does "A" represent?
   A. apocrine sweat gland
   B. sweat pore
   C. sebaceous gland
   D. eccrine sweat gland

58. The diagram illustrates glands of the skin. What does "B" represent?
   A. sweat pore
   B. sebaceous gland
   C. duct of apocrine sweat gland
   D. eccrine sweat gland

59. The diagram illustrates glands of the skin. What does "C" represent?
   A. sebaceous gland
   B. sweat pore
   C. eccrine sweat gland
   D. duct of apocrine sweat gland

60. What type of burn appears white or black with no immediate pain?
   A. fourth-degree
   B. second-degree
   C. first-degree
   D. third-degree
   E. partial-thickness

61. An increase in body temperature causes
   A. an increase in melanin production.
   B. sweating.
   C. arrector pili muscles to contract.
   D. arterioles in the dermis to constrict.
   E. an increase in keratinization of the skin.

62. Which of the following statements concerning vitamin D is false?
   A. Vitamin D is important for calcium homeostasis.
   B. Vitamin D causes the kidney to excrete calcium.
   C. Vitamin D is necessary for the formation of bones and teeth.
   D. Vitamin D begins its synthesis in the skin when the skin is exposed to ultraviolet light.
   E. Vitamin D is necessary for the uptake of calcium from the intestine.

63. Mammary glands are modified ___________ glands that develop within the female breast, whereas ___________ are present in both sexes.
   A. apocrine; scent glands
   B. merocrine; scent glands
   C. apocrine; breasts
   D. sebaceous; sudoriferous glands
   E. sudoriferous; sebaceous glands
64. Which of the following skin changes is usually associated with aging?
   A. Loss of subcutaneous tissue contributes to sagging of the skin.
   B. Localized increase in sebaceous glands leads to dry skin.
   C. Skin becomes thicker.
   D. The amount of collagen in the dermis increases.
   E. There is an increase in the number of elastic fibers in the skin.

65. Melanin production can be influenced by
   A. All of these choices are correct.
   B. hormones.
   C. pregnancy.
   D. genetics.
   E. exposure to sunlight.

66. Which of the following is NOT a complication of a major burn?
   A. fever
   B. hypermetabolic state
   C. decreased protein demand
   D. weight loss
   E. electrolyte imbalance

67. What type of skin gland secretes sweat?
   A. Mammary gland
   B. Ceruminous gland
   C. Sudoriferous gland
   D. Sebaceous gland
   E. None of these

68. Melanin
   A. is absent in individuals known as albinos.
   B. is transferred to other cells by osmosis.
   C. makes the skin lighter.
   D. is increased with exposure to infrared light.
   E. is a pigment produced by cells in the stratum corneum.

69. One type of experimental contraceptive device is a skin patch that contains a chemical absorbed through the skin. Which of the following substances might be the type of chemical involved?
   A. lipid-soluble substances
   B. water-soluble substances
   C. proteins
   D. carbohydrates
   E. amino acids

70. The epidermal layer that is present in the nail bed and the nail matrix is the
   A. stratum lunula.
   B. stratum spinosum.
   C. stratum basale.
   D. stratum lucidum.
   E. stratum corneum.

71. Skin glands do not include
   A. sebaceous glands.
   B. mammary glands
   C. ceruminous glands
   D. sweat glands...
   E. salivary glands.

72. At birth the hairs of the scalp, eyelids, and eyebrows are replaced by coarser pigmented hairs called
   A. vellus hairs.
   B. primary hairs.
   C. terminal hairs.
   D. pubic hairs.
   E. lanugo hairs.

73. The amount of body area involved with a burn is determined by the
   A. cause of the burn.
   B. color of the skin.
   C. ABCDE rule.
   D. amount of pain.
   E. rule of nines.

74. Body odor results from secretions from the ______ sweat glands.
   A. merocrine
   B. ceruminous
   C. eccrine
   D. apocrine
   E. sebaceous
75. The oil of your scalp is secreted by __________ glands associated with the hair follicles.
   A. mammary       C. apocrine sweat       E. sebaceous
   B. merocrine sweat D. ceruminous

76. If you accidentally cut your arm and see connective tissue and fat, which layer(s) was/were cut?
   A. all of these layers       C. stratum corneum       E. dermis
   B. subcutaneous tissue       D. stratum basale

77. A few years ago a young lady here in Idaho was scalped. Assuming that there was still a dense layer of
    connective tissue covering her head musculature… what layers were removed?
   A. epidermis       C. stratum corneum       E. all of these
   B. hypodermis      D. dermis

78. What type of heat exchange (cooling in this case) FAILED in Ace Ventura’s rhino disguise?
   A. conductive       C. convective       E. none of these
   B. radiative       D. all of these

79. Most house dust allergies are actually an immune response to which of the following?
   A. synthetic fibers       C. shed skin cells       E. none of these
   B. construction material chemicals D. dust mite feces

80. Which of the pigments is fat soluble?
   A. carotene       C. keratin       E. none of these
   B. melanin       D. all of these