

Name _____
Team _____
Date _____

2020 Anatomy and Physiology Test

Directions: Please write your name and your team WITH your team number on the top of this page. You are allowed to have one 8.5 x 11 double-sided page containing information from any source and 2 non-programmable, non-graphing calculators. You have 50 minutes to complete this 3 part test, good luck, you may begin.

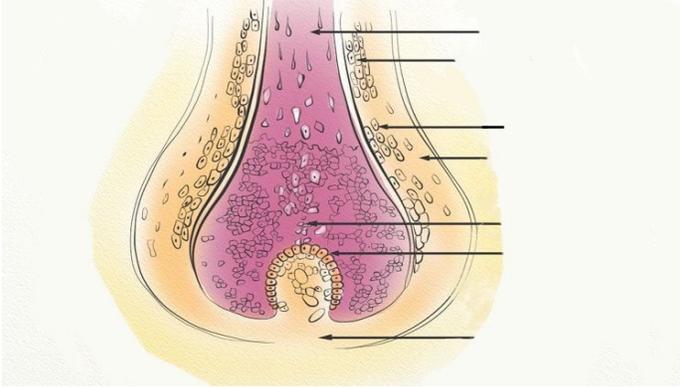
Points:
Part 1: ____
Part 2: ____
Part 3: ____
Total: ____

(Integumentary)

Part 1:

1. List 4 functions of the integumentary system:

2. Label this diagram and list the function of each part:



3. Name and describe the stages of hair growth.

4. What is the technical term for our skin?

5. Name the layers of the skin and describe them.

6. What are the 3 factors that influence skin color?

(7-32 one point each)

- | | |
|--|--------------------|
| 7. ____ cells that produce pigment | A. Keratin |
| 8. ____ upper layer of the dermis | B. Arrector pili |
| 9. ____ water-repellent protein in the epidermis | C. Melanocytes |
| 10. ____ actively mitotic layer in the epidermis | D. Hair shaft |
| 11. ____ Cuticle of fingernail | E. Papillary layer |
| 12. ____ glands that open into hair follicles | F. Eponychium |
| 13. ____ muscle attached to hair follicle | G. Stratum Basale |
| 14. ____ visible part of hair | H. Sebaceous gland |

15. What is the layer of the skin that contains fingerprints?

- | | |
|------------------------------|------------------------------|
| a) Stratum corneum | c) Stratum granulosum |
| b) Reticular layer of dermis | d) Papillary layer of dermis |

16. The skin takes up what percent of the body?

- | | |
|--------|--------|
| a) 20% | c) 12% |
| b) 27% | d) 16% |

17. What type of sweat gland is most widely distributed?

- | | |
|-------------|-----------------|
| a) Eccrine | c) Apocrine |
| b) Exocrine | d) Hypothalamus |

18. In which layer of the skin are sensory receptors and blood vessels embedded in?

- | | |
|--------------|---------------|
| a) Epidermis | c) Hypodermis |
| b) Dermis | |

19. Which layer of the epidermis is only found in the palms of the hands and the soles of the feet?

- | | |
|-----------------------|--------------------|
| a) Stratum basale | c) stratum lucidum |
| b) Stratum granulosum | d) Stratum corneum |

20. How thick is the human skin?

- | | |
|------------|------------|
| a) 1-5.5mm | c) 3-5mm |
| b) 0.5-4mm | d) 1-6.5mm |

21. Which cell is located in the epidermis and is known as "touch cells"?

- | | |
|----------------|-----------------|
| a) Corneocytes | c) Keratinocyte |
| b) Merkel cell | d) Melanocyte |

22. What is vasoconstriction caused by?

- | | |
|--|---|
| a) when blood vessels relax and widen, increasing blood flow and dropping blood pressure | c) when blood vessels relax and widen, increasing blood flow and blood pressure |
| b) when smooth muscles in blood vessel walls tighten, decreasing blood flow | d) when resistance and blood flow decreases in blood vessels |

23. Which cell in the skin is a dendritic cell?

- | | |
|-----------------|--------------------|
| a) Basal cells | c) Squamous cells |
| b) Keratinocyte | d) Langerhan cells |

24. Peter was walking across his front lawn when a nail penetrated the sole of his foot. In which order did the nail penetrate his skin?
- Stratum corneum, stratum granulosum, stratum spinosum, stratum basale, papillary layer, reticular layer
 - Stratum basale, stratum spinosum, stratum granulosum, stratum corneum, reticular layer, papillary layer
 - Stratum corneum, stratum lucidum, stratum granulosum, stratum spinosum, stratum basale, papillary layer, reticular layer
 - Stratum corneum, stratum lucidum, stratum spinosum, stratum granulosum, stratum basale, papillary layer, reticular layer
25. Which type of epithelium is found in capillaries(alveoli, glomeruli ect..)?
- Simple squamous epithelium
 - Simple cuboidal epithelium
 - Simple columnar epithelium
 - Transitional epithelium
26. The epidermis is constantly being replaced by new cells, which layer of the epidermis holds the source of new cells for replacement?
- stratum granulosum/stratum lucidum
 - Papillary layer
 - Stratum basale
 - Stratum spinosum
27. Where in the skin is melanin produced?
- Stratum basale
 - Basement membrane
 - Stratum spinosum
 - Hypodermis
28. If a person has eczema, which layer of their skin isn't functioning correctly?
- Stratum granulosum
 - Stratum basale
 - Stratum corneum
 - Reticular layer
29. What type of burn is painful and exhibits blisters?
- 1st degree
 - 2nd degree
 - 3rd degree
30. What percent of your body has been burned if you receive a burn on your entire right arm?
- 4.5%
 - 9%
 - 15%
 - 10.5%
31. Your toenails are tougher than your fingernails because_____
- There is more blood flow to the fingers than the toes
 - there is a layer of stratum lucidum on the soles of your feet
 - your toenails are made up of denser keratine
 - the feet experiences more friction and has fungi
32. Which type of gland causes greasy hair?
- Sudoriferous glands
 - Ceruminous glands
 - Sebaceous glands
 - Mammary glands

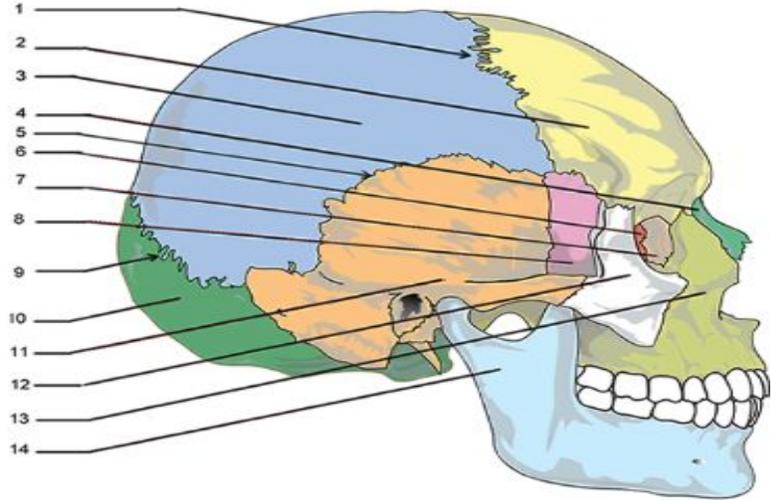
(Skeletal)

Part 3:

33. List 5 basic functions of the skeletal system:

34. Label the sutures of the skull:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
- 11.
- 12.
- 13.
- 14.



35. What's the difference between endochondral and intramembranous ossification? What types of bones do each type of ossification form?

36. Name the steps of endochondral ossification and describe what happens in each of them:

37. What is appositional growth?

38. What is the difference between congenital and neuromuscular scoliosis?

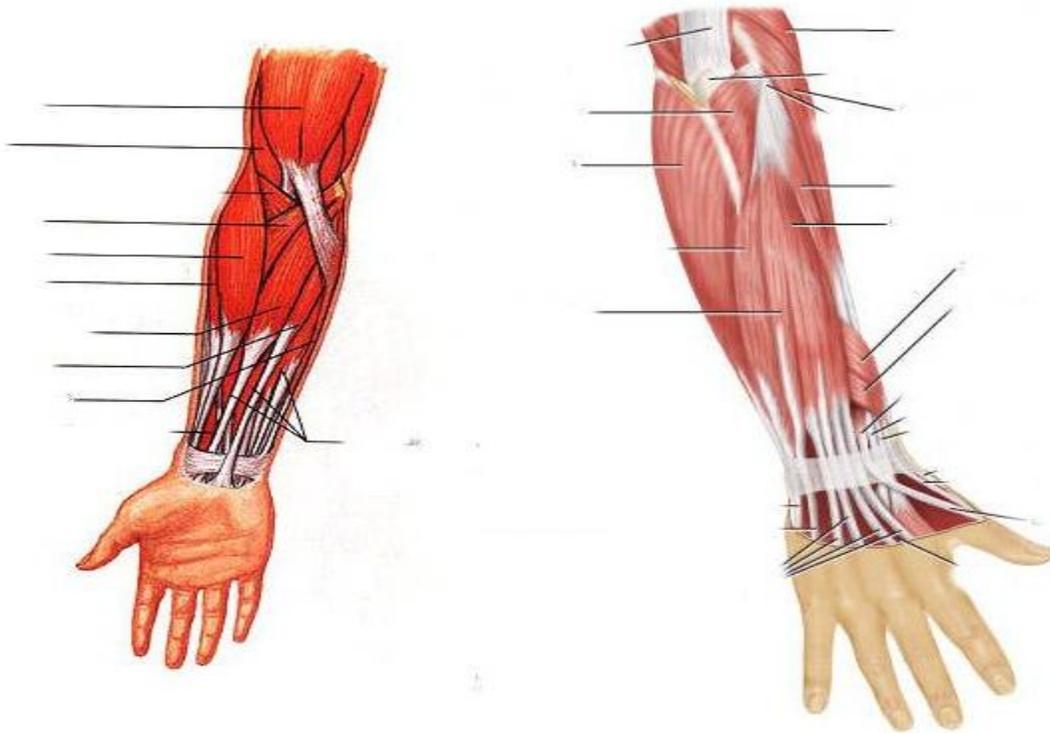
39. Label this long bone:

55. A spiral fracture is when the bone is broken by _____.
- a) Crushing
 - b) Bending
 - c) Sudden impact
 - d) Twisting
56. Which bone hurts the most to break?
- a) Nasal
 - b) 5th phalange
 - c) Navicular
 - d) Femur
57. What is the wrist bone that is directly adjacent to the metacarpal bone of the thumb?
- a) Triquetrum
 - b) Scaphoid
 - c) Trapezium
 - d) Trapezoid
58. What type of joint is the acromioclavicular joint?
- a) Hinge joint
 - b) Condyloid
 - c) Ball and socket
 - d) Plane joint
59. During intramembranous ossification, what type of collagen fibrils are in the extracellular matrix created by osteoblasts?
- a) Type I
 - b) Type II
 - c) Type III
 - d) Type IV
60. Where is the secondary ossification center in a long bone?
- a) Epiphysis
 - b) Diaphysis
 - c) Metaphysis
 - d) Epiphyseal line
61. What type of cartilage is used to attach the false ribs to the true ribs?
- a) Hyaline cartilage
 - b) Fibrocartilage
 - c) Costal cartilage
 - d) Elastic cartilage
62. Which muscle's origin is Immediately below anterior superior iliac spine?
- a) Rectus femoris
 - b) Sartorius
 - c) Vastus lateralis
 - d) Biceps femoris
63. A condyle bone marking would be described as a _____.
- a) large rounded prominence
 - b) Prominence feature
 - c) Groove
 - d) Moderately raised, prominent border
64. What bone marking would a facet fit into?
- a) Facet
 - b) Fissure
 - c) Fossa
 - d) Foramen
65. On which chromosome is the gene that is mutated causing achondroplasia found?
- a) Chromosome 4
 - b) Chromosome 21
 - c) X chromosome
 - d) Chromosome 6

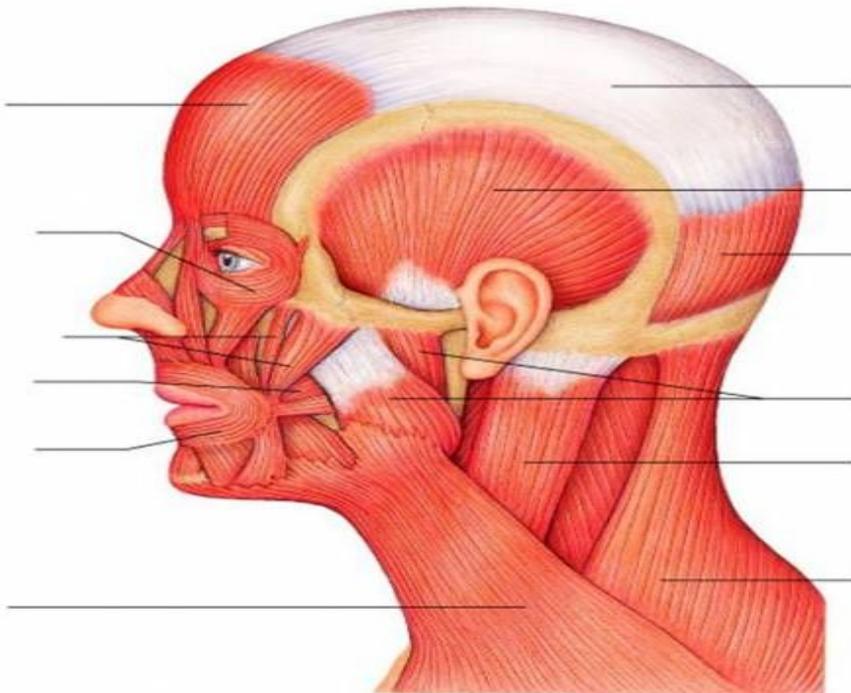
Part 5: (Muscular)

66. List 4 basic functions of the muscular system:

67. Label the diagram below:



68. Label the diagram below.



69. What does BCAAs stand for and how are they important after exercise?

70. What is the all or none principle of muscle contraction?

71. What are the three phases of muscle twitch?

(72-97, one point each)

72. ___ Muscle cell membrane
73. ___ High energy compound in muscle
74. ___ Neurotransmitter at the neuromuscular junction
75. ___ Minimal stimulus needed to cause contraction
76. ___ Attachment of a muscle that moves during contraction
77. ___ Functional unit of muscle
78. ___ Broad flat sheet of tendon
79. ___ Attachment of a muscle that doesn't move during contraction
- A. Origin
B. Aponeurosis
C. Sarcolemma
D. Acetylcholine
E. Threshold
F. Insertion
G. Creatine phosphate
H. Sarcomere
80. What inorganic ion is necessary for myosin heads to bind with receptor sites on actin?
a) Calcium ions
b) Sodium ions
c) Phosphate ions
d) Potassium ions
81. Where is the origin of semitendinosus?
a) Upper medial shaft of tibia below gracilis
b) Upper inner quadrant of posterior surface of ischial tuberosity
c) Upper outer quadrant of posterior surface of ischial tuberosity
d) Immediately below anterior superior iliac spine
82. What is the largest muscle of the pelvic diaphragm?
a) Coccygeus
b) Levator ani muscle
c) Iliococcygeus
d) Piriformis
83. What kind of muscle movement is abduction?
a) Moving towards midline
b) Decreasing angle between bones
c) Moving away from midline
d) Increased angle between the foot and the leg
84. What protein molecule effectively stores the oxygen for aerobic respiration?
a) Tropomyosin
b) Myosin
c) Actin
d) Myoglobin
85. What is the brighter central region within the A-band of a myofibril called?
a) Titin
b) M-line
c) I-band
d) H zone
86. What type of enzyme is myosin?
a) ATP synthase
b) ADP synthase
c) ATP hydrolase
d) ADP hydrolase

87. What section of the sarcomere does not shorten during contraction?
a) A band
b) Z disc
c) I-band
d) distance between Z bands
88. How old do you have to be to fall into the transitional stage of muscular dystrophy?
a) Up to age 7
b) Ages 6-9
c) Ages 10-14
d) Ages 15+
89. Which type of muscle contraction lengthen the muscle?
a) Concentric
b) Eccentric
c) Isometric
90. Which one of these muscles allow the adduction of the hip?
a) Gracilis
b) Sartorius
c) tensor fasciae latae
d) Iliacus
91. How many muscles does it take to smile?
a) 30
b) 22
c) 17
d) 26
92. Which of the following enzymes interacts directly with the myosin binding site of actin?
a) ATP hydrolase
b) Tropomyosin
c) Calsequestrin
d) Troponin
93. Which of the following changes length during sarcomere contraction?
a) Thick filaments
b) Thin filaments
c) H zone
d) All of the above
94. What is the function of the calcium in muscles?
a) It allows tropomyosin to be pulled away from the actin filament
b) It pulls the tropomyosin off the myosin heads
c) It releases the myosin head from t/he active site on actin
d) It helps move the myosin heads into a high energy position
95. Muscles store enough creatine phosphate to regenerate sufficient ATP to sustain contraction for about _____ seconds.
a) 15
b) 20
c) 10
d) 4
96. Which muscle is most likely to be affected when an athlete pulls a hamstring?
a) Soleus
b) Biceps brachii
c) Vastus lateralis
d) Semimebranosus
97. Red muscle fibers would be expected to _____.
a) Contain few mitochondria and tire easily
b) Contain many mitochondria and be impervious to fatigue
c) contain many mitochondria and tire easily
d) Contain few mitochondria and be impervious to fatigue

