

MY SO PRACTICE TEST

DIVISION C - HIGH SCHOOL, GRADES 9-12

PRACTICE TEST

Instructions

- You have 20 minutes to complete this test.
- You may write your answers directly in the test.
- You may use any notes or resources you have created or collected.
- You may use a calculator and scratch paper if necessary.
- Good Luck!

Test Questions

1. Which of the following actions is/are important to take to prevent skin cancer?
 - a. Wear clothes that cover the majority of the body
 - b. Wear sunglasses
 - c. Use sunscreen daily
 - d. All of the above
2. Which of the following is **FALSE** regarding psoriasis?
 - a. It is a chronic, noninfectious disease
 - b. It causes the skin to become very dry and flaky
 - c. It is often not a hereditary condition
 - d. It causes skin cells to rapidly multiply
3. A patient arrives at your emergency room with burns covering their entire right and left arms. Using the rule of nines, what percentage of their total body surface area do you estimate to be covered in burns?
 - a. 9%
 - b. 18%
 - c. 27%
 - d. 36%
4. What part of the nail is responsible for nail growth?
 - a. Nail bed
 - b. Nail plate
 - c. Nail root
 - d. Nail matrix

5. Which phase of the hair cycle typically lasts the longest?
 - a. Anagen
 - b. Catagen
 - c. Telogen
 - d. None of the above

6. Which of the following statements is correct regarding the basal layer of the epidermis?
 - a. It is the most superficial layer of the epidermis
 - b. It is comprised of only one cell type
 - c. It forms epidermal ridges where it meets the dermis
 - d. It is also known as the stratum granulosum

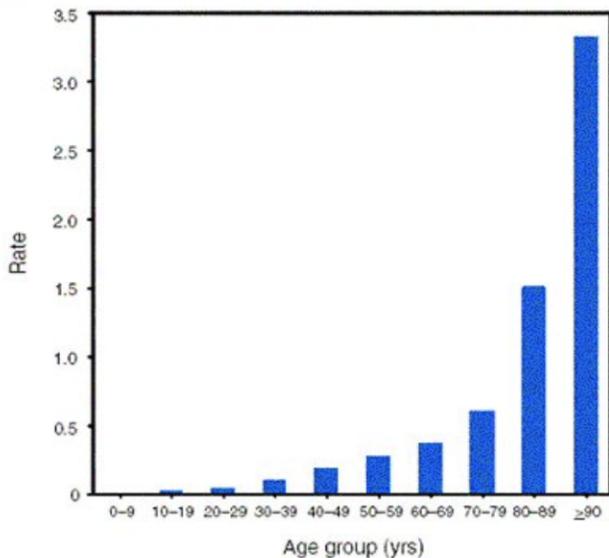
7. Select the correctly matched pigment to the color it expresses in the skin.
 - a. Carotene: brownish-black
 - b. Eumelanin: orange
 - c. Pheomelanin: reddish-yellow
 - d. None of the above

8. Which of the following membranes would be found lining the nasal cavity?
 - a. Serous membrane
 - b. Mucous membrane
 - c. Synovial membrane
 - d. Cutaneous membrane

9. All of the following glands can be found on thick skin EXCEPT:
 - a. Apocrine sweat glands
 - b. Eccrine sweat glands
 - c. Sebaceous glands
 - d. Both B and C

Use the following figure to answer question 10.

FIGURE. Age-adjusted rate* of hypothermia-associated death, by age group — United States, 2001



* Per 100,000 population.

10. Hypothermia is defined as a significant drop in core body temperature below 95oF. The figure above shows deaths attributed to hypothermia by age group. What is one reasonable explanation why hypothermia-associated deaths tend to increase with age?
- Older people have less elastic skin, making them feel cold more easily
 - Older people have drier skin, which inhibits the function of thermoreceptors
 - Older people have fewer heat thermoreceptors than younger people
 - Older people have less blood supply to the dermis, making them feel cold more easily
11. Which of the following is **NOT** a major function of the muscular system?
- Provide elasticity
 - Regulate organ volume
 - Stabilize joints
 - Produce heat
12. You find an unlabelled tissue specimen locked in a storage room in your institution's anatomy and physiology department. After observing the specimen under the light microscope, you observe that the cell morphology resembles branches with gaps between parallel bands. You also find large dark spots in the middle of all cells after adding a DNA stain. From which structure is this specimen most likely derived from?
- Biceps
 - Esophagus
 - Lungs
 - Heart
13. Arrange the following structures of skeletal muscles by diameter in increasing order:
- I) Fascicle II) Myofibril III) Thick filament IV) Muscle fiber V) Muscle
- III < II < IV < V < I
 - III < II < IV < I < V
 - II < IV < III < I < V
 - II < IV < III < V < I
14. Upon observing skeletal muscle using a powerful light microscope, you find dark striations running along the length of the sarcomere. What protein comprises the bulk of these striations?
- Actin
 - Myosin
 - Troponin
 - Tropomyosin
15. Which of the following events is NOT required for skeletal muscles to contract?
- Binding of myosin heads to actin filament
 - Binding of calcium ions to myosin heads
 - Propagation of an action potential along the sarcolemma
 - Production of sufficient ATP for the power stroke
16. Which of the following statements correctly describes one of the sequential events of skeletal muscle contraction?
- Power stroke: myosin head pulls actin filaments toward center of the sarcomere
 - Power stroke: ATP hydrolysis changes conformation of myosin heads to the high-energy state
 - Cocking of the myosin head: myosin head attaches to actin filament and forms crosslink
 - Cocking of the myosin head: myosin head pulls actin filaments toward center of the sarcomere

17. After half an hour of strenuous exercise, what compound would you expect to have accumulated in your skeletal muscles?
- Glycogen
 - Creatine phosphate
 - Lactic acid
 - Oxygen
18. A 55-year old patient has been complaining about severe fatigue that has been recurring for over a year, but has become worse the previous month. The first thing you notice is her unusual facial demeanor, mostly notably drooping eyelids that you first thought was some type of vision problem. After reading her blood test results, you find elevated levels of IgG antibodies in circulation. By performing a physical examination of the face and head, you notice that she has trouble moving her lips and holding her head upright. Her family also has no history of any muscular disorders. Consulting with other doctors, you agree to prescribe her Pyridostigmine, a drug that binds a protein called acetylcholinesterase. You have therefore concluded that your patient is suffering from:
- Poliomyelitis
 - Tetanus
 - Duchenne's muscular dystrophy
 - Myasthenia gravis
19. Which of the following muscles is found in the neck?
- Latissimus dorsi
 - Pectineus
 - Brachialis
 - Sternohyoid
20. The sartorius muscle is the longest in the body and is responsible for providing flexibility to the hip and knee joints. Based on its anatomical position, to what bone would you expect the origin of the sartorius muscle to be?
- Femur
 - Patella
 - Tibia
 - Pelvic
21. Which of the following is **NOT** a function of the skeletal system?
- Storage of phosphorous
 - Shape the body
 - Protect muscles
 - Create blood cells
22. The patella is what type of bone?
- Long bone
 - Short bone
 - Irregular bone
 - Sesamoid bone
23. A short spinous process is characteristic of:
- Lumbar vertebrae
 - Thoracic vertebrae
 - Cervical vertebrae
 - None of the above

24. The joint between the humerus and the ulna is which type of joint?
- a. Ball and socket joint
 - b. Pivot joint
 - c. Saddle joint
 - d. Hinge joint

Use the following image to answer questions 25-28:

25. What type of fracture is shown in this x-ray?
- a. Transverse
 - b. Oblique
 - c. Avulsion
 - d. Impacted
26. Which of the following processes has likely **NOT** begun six weeks into the healing process of this fracture?
- a. Fibroblast development
 - b. Chondroblast development
 - c. Callus formation
 - d. Osteoclast remodeling
27. Is this bone one of the most commonly broken bones?
- a. Yes, it is one of the most commonly broken bones.
 - b. No, it is not one of the most commonly broken bones.
28. Which of the following conditions would you **LEAST** expect a 16-year old patient to have?
- a. Tendonitis
 - b. Juvenile rheumatoid arthritis
 - c. Scoliosis
 - d. Osteoarthritis
29. Which of the following bone markings is **NOT** present on the mandible?
- a. Ramus
 - b. Meatus
 - c. Fossa
 - d. Condyle
30. Respiratory cartilage is a type of...
- a. Hyaline cartilage
 - b. Elastic cartilage
 - c. Fibrocartilage
 - d. None of the above



ANSWER KEY

- | | | | | | |
|-----|----------|-----|----------|-----|----------|
| 1. | D | 15. | B | 29. | B |
| 2. | C | 16. | A | 30. | A |
| 3. | B | 17. | C | | |
| 4. | D | 18. | D | | |
| 5. | A | 19. | D | | |
| 6. | C | 20. | D | | |
| 7. | C | 21. | C | | |
| 8. | B | 22. | D | | |
| 9. | D | 23. | A | | |
| 10. | D | 24. | D | | |
| 11. | A | 25. | B | | |
| 12. | D | 26. | D | | |
| 13. | B | 27. | B | | |
| 14. | B | 28. | D | | |



Practice Test Developed with Science Olympiad at Cornell



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