Instructions (shown before students start the test)

Welcome to the MI Region 7 January Workshop Anatomy B event! Remember this is a practice test intended to provide experience in Scilympiad and gain some familiarity with the of topics and questions that you might see at future invitationals and tournaments. No place recognition will be awarded.

Introduction (shown after students start the test)

The questions contained herein should be pretty straightforward. Do you best and hopefully you will gain some insights.

The questions in this test have been pulled from other invitational tournaments. Most notably, the Centerville 2020 Invitational.

Integumentary System

1. (1.00 pts) Label A in Figure (1) below is pointing to:

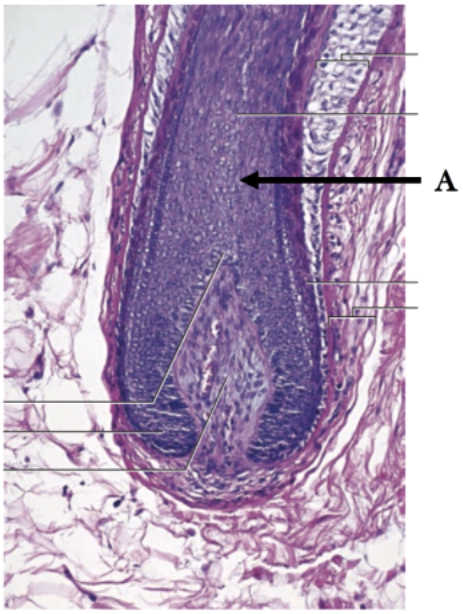

Figure (1)

- A) Cuticle
- B) Cortex
- C) Epiphelial root sheath
- D) Medulla
- E) None of the above

2. (1.00 pts) Choose all that apply. Which of the following proteins are correctly matched with their function?

(Mark **ALL** correct answers)

- A) Trichohyalin – Forms complexes that spread out over the cell surface and waterproof it
- B) Loricrin – Contributes to the formation of a cell envelope attached to the inner surface of the plasma membrane of keratinocytes
- C) Carotene – Contributes to the greenish color of skin
- D) Filaggrin – Binds cytoskeletal keratin filaments together into coarse, tough bundles
- E) None of the above

3. (1.00 pts) Which of the following functions of hair is considered vestigial?

- A) Vibrissae prevent foreign particles from entering the body easily
- B) Scalp hair retains heat
- C) Body hair serves to keep the body warm
- D) Eyebrows function in facial expression
- E) None of the above

4. (1.00 pts) What type of hair can be described as fine, pale, and found mostly on children?

- A) Velds
- B) Lanugo
- C) Terminal
- D) Club
- E) None of the above

5. (1.00 pts) Choose all that apply. Which of the following are serous glands?

- A) Sebaceous glands
- B) Ceruminous glands
- C) Mammary Glands
- D) Sudoriferous glands
- E) None of the above

6. (1.00 pts) Choose all that apply. Which of the following substances are excreted by eccrine sweat glands?

(Mark **ALL** correct answers)

- A) Potassium
- B) Ammonia
- C) Calcium
- D) Lactic Acid
- E) None of the above

7. (1.00 pts) In humans, contraction of the piloerector muscle serves no useful function.

True False

8. (1.00 pts) Tattooing involves injecting ink with a needle into the epidermis.

True False

9. (1.00 pts) Dermal papillae are numerous in palmar and plantar skin but few in number in the skin of the face and abdomen.

True False

10. (1.00 pts) All of the following contribute to the color of skin EXCEPT:

A) Collagen
B) Carotene
C) Bilirubin
D) Hemoglobin
E) None of the above

11. (1.00 pts) What element contributes to the harder version of keratin in nails?

A) Calcium
B) Potassium
C) Phosphorus
D) Sulfur
E) None of the above

12. (1.00 pts)
A 50-year old male has suffered second and third degree burns to the entire thorax, anterior right arm, and anterior portion of the upper left leg. What percent of his total body surface area is burned?

A) 9%
B) 18%
C) 27%
D) 36%
E) 45%

Skeletal System

13. (1.00 pts) Osteoid consists mainly of what type of collagen?

A) Type III
B) Type I
C) Type IV
D) Type II
E) None of the above

14. (1.00 pts) What substance is responsible for mineral resorption of bone?

A) Ammonia base
B) Phosphoric acid
C) Hydrochloric acid
D) Sodium hydroxide base
E) None of the above

15. (1.00 pts) Choose all that apply. Which of the following synovial joints are correctly matched with the number of degrees of freedom they have?

(Mark **ALL** correct answers)
A) Ball-and-socket – 4

- [ ] B) Ellipsoid – 3
- [ ] C) Hinge - 2
- [ ] D) Saddle - 2
- [ ] E) None of the above

16. (1.00 pts) The fracture shown in Figure (6) above can best be described as:

Figure (6)

- A) Displaced oblique fracture of the femur
- B) Displaced oblique fracture of the humerus
- C) Nondisplaced transverse fracture of the humerus
- D) Nondisplaced transverse fracture of the femur
- E) None of the above

17. (1.00 pts) Osteogenic cells can be found in all of the following EXCEPT:

- A) Volkmann's canal
- B) Periosteum
- C) Endosteum
- D) Haversian canal
- E) None of the above

18. (1.00 pts) Choose all that apply. What two zones of the metaphysis are responsible for a child's growth in height?

(Mark **ALL** correct answers)

- [ ] A) Zone of hypertrophy
- [ ] B) Zone of bone deposition
- [ ] C) Zone of cell proliferation
- [ ] D) Zone of calcification
- [ ] E) None of the above

19. (1.00 pts)
A paramedic notices that cerebrospinal fluid is leaking out of the nose of a 45-year old male just involved in a car crash. The fracture of what bone is the most likely cause of this leakage:

- A) Vomer
- B) Ethmoid
- C) Sphenoid
- D) Temporal
- E) None of the above

20. (1.00 pts) People with Wormian bones have more than 206 bones.

True False

21. (1.00 pts) Osteoclasts have one nucleus.

True False

22. (1.00 pts) The excessive consumption of cola is associated with loss of bone density in women, but not men.

True False

23. (1.00 pts) Long bones of the hand and fingers develop only one epiphyseal plate.

True False

24. (1.00 pts) In bones with two secondary ossification centers, one center lags behind the other.

True False

Muscular System

25. (1.00 pts) Choose all that apply. Which of the following muscles contribute to forced exhalation?

(Mark **ALL** correct answers)

- A) Internal oblique
- B) External oblique
- C) External Intercostals
- D) Internal Intercostals
- E) None of the above

26. (1.00 pts) Tendons are made of:

- A) Dense irregular connective tissue
- B) Areolar tissue
- C) Reticular tissue
- D) Dense regular connective tissue
- E) None of the above

27. (1.00 pts) Which of the following muscles contribute to medial rotation of the leg?

- A) Gluteus maximus
- B) Gluteus medius
- C) Semimembranosus
- D) Iliopsoas
- E) None of the above

28. (1.00 pts) Which of the following ions is responsible for depolarization of the sarcolemma?

- A) Sodium
- B) Potassium
- C) Chloride
- D) Calcium
- E) None of the above

29. (1.00 pts) Which of the following is important in maintaining smooth muscle tone?

- A) Latch-bridge mechanism
- B) Anaerobic respiration
- C) Short latent period
- D) Large number of mitochondria
- E) None of the above

30. (1.00 pts) Choose all that apply. Which of the following types of contraction occur in healthy individuals?

(Mark **ALL** correct answers)

- [ ] A) Twitch
- [ ] B) Incomplete Tetanus
- [ ] C) Multiple motor unit summation
- [ ] D) Complete tetanus
- [ ] E) None of the above

31. (1.00 pts) The speed of shortening of a muscle is greatest when:

- A) Load is equal to maximum isometric tension
- B) Load is less than maximal isometric tension but greater than 0
- C) Load is 0
- D) Load is greater than maximal isometric tension
- E) None of the above

32. (1.00 pts) Choose all that apply. Which of the following ions are found in higher concentrations outside of a myofibril?

(Mark **ALL** correct answers)

- [ ] A) Calcium
- [ ] B) Chloride

C) Potassium

D) Sodium

E) None of the above

33. (1.00 pts) All myosin heads within a sarcomere are synchronized, binding and letting go of actin at the same time.

True False

34. (1.00 pts) Gap junctions are found in cardiac and smooth muscle.

True False

35. (1.00 pts) The replacement of the gastrocnemius, peroneus longus, and peroneus brevis by a single larger muscle would produce more power during plantar flexion.

True False

36. (1.00 pts) Muscle tone maintains optimum sarcomere length.

True False

37. (1.00 pts) Complete tetanus is the same as spastic paralysis.

True False

All Done! Good Luck on your other events today and we hope to see you soon. Remember that some of the event supervisors today will be available thru the virtual meeting.