

**NBCE
MOCK BOARD QUESTIONS
Physiology - A**

1. Sympathetic reflexes are geared more for maintaining _____ than for maintaining _____.
 - A. cardiac output; arterial pressure
 - B. arterial pressure; cardiac output
 - C. venous pressure; cardiac output
 - D. cardiac output; venous pressure

2. The usual cardiac reserve is about:
 - A. 300 to 400 percent in a young healthy adult
 - B. 500 to 600 percent in an athletically trained person
 - C. zero in heart failure
 - D. all of the above

3. The Bainbridge reflex causes a/an _____ in heart rate
 - A. Decrease
 - B. Increase
 - C. No change

4. A build up of _____ may cause _____ (heart pain).
 - A. Glycogen; pleurisy
 - B. Pyruvic acid; angina
 - C. Glucose-3-phosphate; angina
 - D. Lactic acid; angina

5. The usual cause of cardiac failure is
 - A. damage to heart valves
 - B. vitamin B deficiency
 - C. decreased contractility of myocardium
 - D. external pressure around heart

6. Angina pectoris is often felt
 - A. Beneath the upper sternum
 - B. Neck
 - C. Side of the face
 - D. All of the above

7. When arterial pressure falls low enough, coronary blood flow decreases below that required for adequate nutrition for the myocardium; this is called
 - A. vasomotor failure
 - B. cardiac depression
 - C. sludged blood
 - D. compensated shock

8. In the absence of circulatory reflexes, venous return _____ when right atrial pressure increases to 7 mmHg
- A. Decreases to 5 liters/min
 - B. Increases to 5 liters/min
 - C. Is zero
 - D. Is normal
9. In anaerobic conditions an energy source for cardiac muscle is
- A. Glycolysis
 - B. Krebs cycle
 - C. Beta oxidation
 - D. Pentose phosphate phunt
10. Which of the following lists the elements of the heart's conduction system in the correct order?
- A. SA node, AV bundle, bundle branches, AV node, Purkinje fibers
 - B. AV node, SA node, AV bundle, bundle branches, Purkinje fibers
 - C. SA node, AV node, AV bundle, bundle of branches, Purkinje fibers
 - D. SA node, AV bundle, AV node, bundle branches, Purkinje fibers
11. Ventricular escape
- A. is the ventricles' resuming rhythmic contraction
 - B. occurs after strong vagal stimulation
 - C. is caused by Purkinje fibers' developing rhythmicity of their own
 - D. all of the above
12. By having a delay in the cardiac impulses traveling from the atria to the ventricles,
- A. there is plenty of time for ventricular muscle to rest
 - B. the semilunar valves close tightly
 - C. the aorta reaches low pressure
 - D. contents of atria empty into the ventricles before ventricular contraction begins
13. Which of the following lists the electrical activity of the heart in the correct sequence?
- A. plateau, rapid depolarization, repolarization, refractory period
 - B. refractory period, repolarization, reapid depolarization, plateau
 - C. repolarization, rapid depolarization, refractory period, plateau
 - D. rapid depolarization, plateau, repolarization, refractory period
14. Once a cardiac impulse reaches the ends of the Purkinje fibers, its transmission is continued through
- A. the S-A node
 - B. the A-V node
 - C. the ventricular muscle fibers
 - D. the A-V bundle

15. Which type of diet increases glycogen stored in muscle and endurance time at marathon speed most?
- A. high fat
 - B. mixed
 - C. high carbohydrate
 - D. fasting
16. The cephalic stage of gastric secretion
- I. results from sight, smell, thought or taste of food
 - II. is initiated by defecation
 - III. provides about 20% of the gastric secretions needed to digest a meal
 - IV. is stimulated by release of digestive hormones
- A. I and II
 - B. I and III
 - C. I, II and III
 - D. I and IV
17. Which of these mainly stimulates the secretion of bicarbonate fluid
- A. acetylcholine
 - B. gastrin
 - C. cholecystinin
 - D. secretin
18. The proximal half of the large intestine functions mainly
- A. to store
 - B. to absorb nutrients
 - C. to secrete waste material into the lumen
 - D. to absorb water and electrolytes
19. Select the statement that is not correct concerning the secretion of gastrin and /or hydrochloric acid.
- A. neural signals from local enteric reflexes cause the antral
 - B. gastrin stimulates the peritubular cells to release secretin
 - C. gastrin is absorbed into the blood and to the oxyntic glands
 - D. gastrin stimulates the parietal cells to release hydrochloric acid
20. Most amino acids are transported by:
- A. sodium co-transport
 - B. diffusion
 - C. osmosis
 - D. active transport

21. Removal of most or all of the stomach may cause:
- A. gastric
 - B. inability to digest protein
 - C. pernicious anemia
 - D. scurvy
22. The most important controller of insulin secretion is
- A. blood glucose levels
 - B. blood amino acids levels
 - C. body weight
 - D. glucagons levels in blood
23. Symptoms of Addison's disease include
- A. minerals corticoid deficiency
 - B. glucocorticoid deficiency
 - C. hyperpigmentation
 - D. all of the above
24. Which hormone has an important role in lactation and parturition?
- A. progesterone
 - B. ACTH
 - C. Oxytocin
 - D. ADH
25. Which hormone increase potassium excretion and sodium retention by the body?
- A. ADH
 - B. Glucagons
 - C. Aldosterone
 - D. ACTH
26. Smooth muscle tissue is found:
- A. attached to bones
 - B. lining hollow organs and body tubes
 - C. in the wall of the heart (only)
 - D. lining long bones
27. Multiple motor unit summation is defined as the:
- A. ability of a single motor neuron to stimulate multiple myofibers
 - B. stimulation of a single myofiber by multiple motor neurons
 - C. simultaneous contraction of all muscle cells in a single-unit smooth muscle network
 - D. process of increasing the number of active motor units during the contraction of a skeletal muscle

28. The sustained partial contraction of a portion of skeletal muscle is called:
- A. treppe
 - B. incomplete tetany
 - C. a simple twitch
 - D. tone
29. The ability of smooth muscle to maintain a force of contraction level even with lengthening or shortening is called
- A. reverse stress-relaxation
 - B. stress-relaxation
 - C. reverse stress-relaxation or stress-relaxation
 - D. latch mechanism
30. The muscle protein whose functions is related to its golf club-like shape is:
- A. actin
 - B. troponin
 - C. tropomyosin
 - D. myosin
31. The purpose of T tubules is to:
- A. generate ATP
 - B. store calcium ions
 - C. produce additional myofilaments in response to exercise
 - D. conduct the muscle action potential toward the sarcoplasmic reticulum
32. Muscle cells with relatively few mitochondria that generate most of their ATP via glycolysis and that have low resistance to fatigue are most likely:
- A. slow oxidative skeletal muscle fibers
 - B. fast oxidative skeletal muscle fibers
 - C. fast glycolytic skeletal muscle fibers
 - D. cardiac muscle fibers
33. Cylindrical muscle cells that contain multiple nuclei located peripherally within the cell would be:
- A. skeletal muscle cells only
 - B. single unit smooth muscle cells
 - C. multiunit smooth muscle cells
 - D. cardiac muscle cells only
34. Release of neurotransmitters in humans is usually dependent on release of which ion?
- A. Calcium
 - B. Sodium
 - C. Potassium
 - D. Chloride

35. Velocity of conduction in nerve fibers is fastest in
- A. smaller, myelinated fibers
 - B. larger, myelinated fibers
 - C. smaller, unmyelinated fibers
 - D. large, unmyelinated fibers
36. When an action potential begins which of the following occurs?
- A. Membrane potential becomes less negative
 - B. Activation gate opens
 - C. Sodium ions enter cell
 - D. Inactivation gate closes slowly
 - E. These events occur in this sequence
37. Cells that can generate electrochemical impulse at their membranes are called:
- A. mobile
 - B. excitable
 - C. reactive
 - D. stimulatory
38. Slow waves (routinely)
- A. cause motion by themselves
 - B. reach threshold
 - C. can initiate action potential
 - D. probably are caused by movement of calcium ions
39. Membrane potential's going above zero millivolts during an action potential is called
- A. positive after potential
 - B. positive conductance
 - C. positive conductance
 - D. overshoot
40. Diisopropylfluorophosphate
- A. inactivates acetylcholinesterase
 - B. causes increase in acetylcholine with successive nerve impulses
 - C. works for weeks
 - D. all of the above
41. Some nerve fibers are externally covered with
- A. axoplasm
 - B. veratrine
 - C. plasmalemma
 - D. a myelin sheath

42. A slow increase in the internal voltage of the nerve fiber that does not result in firing is called _____.
- A. threshold
 - B. accommodation
 - C. positive feedback
 - D. calcium deficiency
43. The property of muscle tissue that describes its ability to receive and respond to stimuli is:
- A. excitability
 - B. elasticity
 - C. contractility
 - D. extensibility
44. Sections of the tubular system that are responsive to ADH include
- I. late distal tubule
 - II. diluting segment of the distal tubule
 - III. cortical collecting duct
 - IV. collecting duct
- A. I, and II
 - B. I, II and III
 - C. I, III and IV
 - D. II, III and IV
45. When sodium and chloride concentrations at the macula densa are too low
- A. rennin release will cause the efferent arteriole to constrict
 - B. aldosterone release will cause the efferent arteriole to constrict
 - C. rennin release will cause the afferent arteriole to constrict
 - D. aldosterone release will cause the afferent arteriole to constrict
46. Initial glomerular filtrate has an osmolality that is about:
- A. twice as great as that of the plasma
 - B. half that of the plasma
 - C. the same as the plasma
 - D. 25% that of the plasma
47. About how long is required to establish equilibrium everywhere in the body after a quantity of water is added by the normal route?
- A. an hour
 - B. ten minutes
 - C. thirty minutes
 - D. two hours

48. Granules in smooth muscle cells of the afferent and efferent arterioles in the juxtaglomerular complex contain
- A. angiotensin
 - B. rennin
 - C. epinephrine
 - D. aldosterone
49. When extracellular fluid levels of potassium are high, (eg. 7.5 mEq/liter) several things occur to return the level to “normal”; these include:
- I. Activation of the Na-K ATP pump
 - II. K⁺ diffuses from the tubular lumen
 - III. Na⁺ levels must be very low to allow the K⁺ to be “pumped”
- A. I and II
 - B. I only
 - C. I, II and III
 - D. II and III
50. With much greater oxygen requirements during exercise:
- A. the blood is still nearly saturated with oxygen as it leaves the pulmonary capillaries
 - B. the number of pulmonary capillaries through which blood flows increases
 - C. the ventilation-perfusion ratio is closer to one
 - D. an increment of blood is in the pulmonary capillaries less time
 - E. all of the above

**NBCE
Mock Board Questions
Physiology - A
Answer Key**

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

- 15. C
- 16. B
- 17. D
- 18. D
- 19. B
- 20. A
- 21. C
- 22. A
- 23. D
- 24. C
- 25. C
- 26. B
- 27. D
- 28. D
- 29. C
- 30. D
- 31. D
- 32. C
- 33. A

- 34. A
- 35. B
- 36. E
- 37. B
- 38. C
- 39. D
- 40. D
- 41. D
- 42. B
- 43. A
- 44. C
- 45. A
- 46. C
- 47. C
- 48. B
- 49. A
- 50. E