1. You have exam version B. Please bubble in an “b” for question 1. Not worth points!

2. (PeerWise) Which of the following descriptions is characteristic of fast-glycotic Type 2b fibers?
   a. **Type of myosin is FAST**
   b. Color of muscle is RED
   c. Rate of fatigue is SLOW
   d. Number of capillaries is HIGH
   e. Source of ATP is aerobic respiration

3. What gives slow-oxidative muscle fiber its dark red color?
   a. A low amount of myosin
   b. The myofibrils
   c. **A high amount of myoglobin**
   d. A high amount of glycogen
   e. The low amount of capillaries

4. What is the primary “weakness” of a fast oxidative muscle fiber?
   a. Cannot use oxygen to make ATP
   b. **Fatigues in less than an hour**
   c. Myofibrils are small
   d. Has a slow contraction velocity
   e. Has no myoglobin

5. In the figure to the right, the light-stained areas represent:
   a. Type 2a fibers
   b. Type 2b fibers
   c. **Type 1 fibers**

6. (PeerWise) Which of the following is NOT a result of endurance training?
   a. a change from Type 2b to Type 2a muscle fibers
   b. **a decreased amount of mitochondria in the muscle fibers**
   c. hypertrophy of the heart
   d. a lower resting heart rate

7. Which is FALSE about measuring blood pressure?
   a. The cuff should be inflated to a higher pressure when measuring blood pressure in someone with high blood pressure.
   b. The first appearance of the sound marks systolic pressure
   c. Pressure in the cuff drops during the reading
   d. **Blood pushing against venous valves causes the sound**
   e. The last appearance of the sound marks diastolic pressure

8. (PeerWise) In which blood vessel is oxygen exchanged between blood and the body?
   a. **Capillaries**
   b. Arteries
   c. Venules
d. Arterioles

e. Veins

9. Which is the best explanation of why venoconstriction increases cardiac output?
   a. Constriction of valves in veins increases venous return
   b. Cardiac output is defined by venoconstriction and vasoconstriction
   c. **The majority of blood is on the venous side of the circulatory system**
   d. Venoconstriction pushes blood through arteries faster
   e. Venoconstriction redirects blood to the heart and away from skeletal muscle

Venoconstriction increases blood flow to heart because so much of blood is “stored” in the stretchy venous side. The veins are a ready reservoir to increase cardiac output by making veins less stretchy. None of the other options are even vaguely true.

10. (PeerWise) Which choice below has the correct order for blood from highest pressure to lowest pressure?
   a. Arterioles, right atrium, capillaries
   b. Arteries, veins, capillaries
   c. **Arterioles, capillaries, veins**
   d. Arterioles, arteries, veins
   e. Capillaries, veins, arterioles

11. Cardiac output is best considered as a function of:
   a. **Stroke volume and heart rate**
   b. Heart rate and SA node firing rate
   c. Ventricular pressure and stroke volume
   d. Ventricular pressure and aortic pressure

12. (PeerWise) Which of the following best describes the Frank-Starling Law of the heart?
   a. The Sympathetic NS fires more, which results in an increased stroke volume
   b. Epinephrine is released by the adrenal gland
   c. Venoconstriction increases venous return
   d. A healthy heart can pump out however much blood is put into it
   e. More cardiac output is a result of increased epinephrine

13. (PeerWise) Epinephrine released by the adrenal gland directly ______
    a. increases end-systolic volume (ESV)
    b. **increases ventricular contraction**
    c. increases skeletal muscle contraction
    d. decreases cardiac output
    e. decreases heart rate

14. Which of the of the following contributes to the INCREASE of stroke volume?
    a. epinephrine to SA node
    b. parasympathetic nerves to the SA node
    c. a reduced EDV
    d. a faster heart rate
    e. **sympathetic nerves to ventricular muscle**
15. (PeerWise) Which of the following is a result of local factors during exercise?
   a. Increased sympathetic nervous system
   b. Increased venous return
   c. Reduced blood flow to certain organs
   d. Increased vasoconstriction
   e. Dilated arterioles

16. (PeerWise) Which of the following is NOT result of exercise hypertrophy of the heart?
   a. Increased end-diastolic volume
   b. Thicker heart muscle
   c. Increased end-systolic volume
   d. Increased contraction strength
   e. Larger heart chamber

17. (PeerWise) A marathon runner would have a __________ resting heart rate and their maximum heart rate will be ________________ compared to a non-runner.
   a. higher; lower
   b. lower; the same
   c. lower; higher
   d. higher; higher
   e. lower; lower

18. (PeerWise) Which is NOT a treatment for coronary artery disease?
   a. Bypass surgery
   b. Stent surgery
   c. Drugs
   d. Surgical removal of plaque
   e. Exercise and diet

19. Atherosclerosis can cause all of the following EXCEPT:
   a. Valve disease
   b. Artery blockage due to ruptured plaque
   c. Stroke
   d. Ischemia
   e. Myocardial infarction

20. What is considered an effective (if expensive) treatment for a cerebral aneurysm to prevent rupture?
   a. Stent
   b. Blood thinners
   c. Platinum coil
   d. Bypass surgery

21. What does a carotid endarterectomy help prevent?
   a. Heart attack
   b. Stroke
   c. Aneurysm
   d. Hypertension
22. The definition of heart failure is:
   a. Enlarged cardiac muscle
   b. **Insufficient cardiac output**
   c. Weakened cardiac muscle
   d. Blockage of blood flow
   e. Widespread edema and shortness of breath

23. Diastolic heart failure is:
   a. Often due to valve regurgitation
   b. **Characterized by a stiff heart**
   c. A result of weak contractions of the heart
   d. A problem with the heart emptying

24. Systolic heart failure is:
   a. A problem with the heart filling
   b. Characterized by high ventricular pressure
   c. **Often the result of several small heart attacks**
   d. A result of valve stenosis

25. A person has an enlarged heart with a reduced stroke volume. Which is the LEAST likely diagnosis?
   a. **Exercise hypertrophy**
   b. Diastolic heart failure
   c. Systolic heart failure
   d. Hypertrophic cardiomyopathy

26. What does the figure to the right represent?
   a. **Diastolic heart failure**
   b. Systolic heart failure

27. What color is blood?
   a. **Red**
   b. Yellow
   c. Green
   d. Blue
   e. Red or blue, depending on oxygen

28. What valve separates the right atrium from the right ventricle?
   a. Aortic
   b. **Tricuspid**
   c. Pulmonary

29. What type of valve is the arrow pointing to in the figure to the right?
   a. **Atrio-ventricular**
   b. Semilunar
30. During what part of the cardiac cycle are both the AV and semilunar valves closed?
   a. Isovolumic ventricular contraction
   b. Late diastole
   c. Atrial systole
   d. Ventricular ejection

31. The first heart sound is associated with:
   a. The AV valves closing
   b. The AV valves opening
   c. The semilunar valves opening
   d. The semilunar valves closing

32. During diastole, blood leaks back into the left atrium. This is:
   a. Aortic stenosis
   b. Mitral prolapse
   c. Mitral regurgitation
   d. Mitral stenosis
   e. Aortic regurgitation

33. In the diagram to the right, the shaded curve represents a disease state. Which of the following is NOT true of the disease?
   a. The EDV is about 200 ml
   b. The stroke volume is elevated
   c. The maximum ventricular pressure is higher than normal
   d. The heart is unable to fill with blood
   e. The lowest ventricular volume is about 50 ml

34. How would a Wiggers diagram show hypertension?
   a. Elevated atrial volume
   b. Elevated aortic volume
   c. Elevated atrial and ventricular pressure
   d. Elevated ventricular and aortic pressure

35. Which of the following is not a correct direction for an action potential to travel through the conduction pathways in the heart?
   a. Purkinje fibers to AV node
   b. SA node to atrial muscle
   c. AV node to bundle branches
   d. Bundle branches to Purkinje fibers

36. Which of the following does NOT contain myosin for muscle contraction?
   a. Heart muscle cell
   b. Motor neuron
   c. Skeletal muscle fiber
37. Which of the following have/has a resting membrane potential?
   a. Muscle cells, heart cells, and neurons
   b. Neurons only
   c. Muscle cells and neurons only

   Since heart cells conduct action potentials, they must have a resting membrane potential.

38. Which of the following produces ONLY an early QRS wave?
   a. Ventricular fibrillation
   b. PVCs
   c. Atrial fibrillation
   d. Atrial flutter
   e. AV block

39. Which of the following is the correct relationship of events in an action potential in a post-synaptic membrane?
   a. Voltage-gated potassium channel closes, membrane returns to resting potential
   b. Ligand binds to ligand-gated sodium channel, membrane becomes more negative inside
   c. Voltage-gated potassium channel opens, membrane depolarizes
   d. Voltage-gated sodium channel opens, membrane becomes more positive inside

   Two right answers

40. Afferent neurons:
   a. Are part of the autonomic nervous system
   b. Carry sensory information to the brain
   c. Are part of the central nervous system
   d. Are part of the somatic nervous system

41. Control of heart rate is:
   a. Somatic
   b. Autonomic

42. If the figure to the right is a neuromuscular junction, the number “4” represents:
   a. A ligand-gated sodium channel
   b. The synapse
   c. A sodium-potassium pump
   d. ATP
   e. Myosin

43. Nicotine is an example of an:
   a. Agonist
   b. Antagonist

44. The neuromuscular junction is found at the:
   a. Muscle body
   b. Sarcomere
   c. Muscle fiber
   d. Muscle fascicle
45. Which band contains only actin?
   a. A band
   b. H zone
   c. I band

46. In order for it to function correctly, is important that the sarcoplasmic reticulum be near:
   a. The Z disk and H zone
   b. The T tubules and troponin
   c. Mitochondria and microtubules
   d. Sarcolemma and mitochondria

47. The binding of ATP to myosin causes the myosin to:
   a. Bind to actin
   b. Move to the 90° position
   c. Release actin
   d. Pull on actin

48. Botulinum toxin acts on:
   a. Ach binding at the postsynaptic cell
   b. Vesicle binding in the presynaptic cell
   c. Ach reuptake in the presynaptic cell
   d. Ligand binding in the postsynaptic cell

49. Sarin blocks the binding site of:
   a. Sodium potassium pumps
   b. Ligand-gated sodium channels
   c. Acetylcholinesterase
   d. Myosin

50. Muscle cells have enough creatine phosphate for:
   a. 4 sec of contraction
   b. 1 min of contraction
   c. 20 min of contraction
   d. Over 1 hour of contraction

51. Which of the following best describes aerobic respiration compared to anaerobic respiration?
   a. Requires mitochondria but produces more ATP
   b. Fast ATP production but requires oxygen
   c. Produces less ATP but can utilize fats as well as glucose for fuel
   d. Requires oxygen but produces more powerful contractions

This is the end of the exam.