Physiology:

1. The AV valve remains open in: (020).
   A. Ventricular diastole
   B. Passive filling
   C. C wave

A ~~A~~ B C

2. All the heart valves are open during which stage of cardiac cycle:
   A. Systolic ejection
   B. Isovolumertric relaxation
   C. Isovolumetric contraction
   D. None of the above

A B C ~~D~~

3. Which of the following structures will have the slowest rate of conduction of the cardiac action potential? (guyton)
   A. Atrial muscle
   B. Anterior internodal pathway
   C. A-V bundle fibers
   D. Purkinje fibers
   E. Ventricular muscle

A B ~~C~~ D E

4. What is the normal total delay of the cardiac impulse in the A-V node + bundle?(guyton)
   A. 0.22 second
   B. 0.18 second
   C. 0.16 second
   D. 0.13 second
   E. 0.09 second

A B C ~~D~~ E

5. If the S-A node discharges at 0.00 seconds, when will the action potential normally arrive at the epicardial surface at the base of the left ventricle?(guyton)
   A. 0.22 second
   B. 0.18 second
   C. 0.16 second
   D. 0.12 second
   E. 0.09 second

~~A~~ B C D E

6. What is the membrane potential (threshold level) at which the S-A node discharges?(guyton)
   A. −40 millivolt
   B. −55 millivolt
   C. −65 millivolt
   D. −85 millivolt
   E. −105 millivolt

~~A~~ B C D E

7. In which phase of the ventricular muscle action potential is the sodium permeability the highest? (guyton)

A. 0
B. 1
C. 2
D. 3
E. 4

A ✓
B
C
D
E

8. If the Purkinje fibers, situated distal to the A-V junction, become the pacemaker of the heart, what is the expected heart rate? (guyton)

A. 30/min
B. 50/min
C. 60/min
D. 70/min
E. 80/min

A ✓
B
C
D
E

9. If the S-A node discharges at 0.00 seconds, when will the action potential normally arrive at the A-V node? (guyton)

A. 0.03 second
B. 0.09 second
C.0.12 second
D. 0.16 second
E. 0.80 second

A ✓
B
C
D
E

10. What is the delay between the S-A node discharge and arrival of the action potential at the ventricular septum?(guyton)

A. 0.80 second
B. 0.16 second
C. 0.12 second
D. 0.09 second
E. 0.03 second

A
B ✓
C
D
E

11. A patient had an ECG at the local emergency department. he attending physician stated that the patient had an A-V nodal rhythm. What is the likely heart rate?(guyton)

A. 30/min
B. 50/min
C. 65/min
D. 75/min
E. 85/min

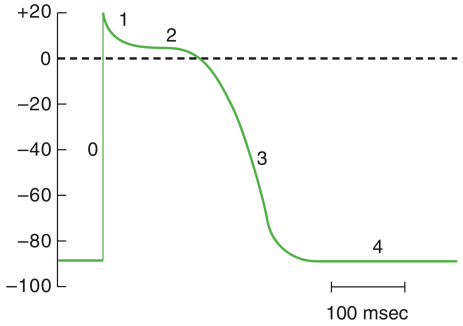
A
B ✓
C
D
E

12. In the sinoatrial (SA) node, phase 4 depolarization (pacemaker potential) is attributable to :(BRS)

A. an increase in K+ conductance
B. an increase in Na+ conductance
C. a decrease in Cl− conductance
D. a decrease in Ca2+ conductance
E. simultaneous increases in K+ and Cl− conductances

A
B ✓
C
D
E

Questions 13-15. (BRS)



13. During which phase of the ventricular action potential is the membrane potential closest to the K+ equilibrium potential?

A. Phase 0
B. Phase 1
C. Phase 2
D. Phase 3
E. Phase 4

A
B
C
D
E ✓

14. During which phase of the ventricular action potential is the conductance to Ca2+ highest?

A. Phase 0
B. Phase 1
C. Phase 2
D. Phase 3
E. Phase 4

A
B
C ✓
D
E

15. Which phase of the ventricular action potential coincides with diastole?

A. Phase 0
B. Phase 1
C. Phase 2
D. Phase 3
E. Phase 4

A
B
C
D
E ✓

16. The low-resistance pathways between myocardial cells that allow for the spread of action potentials are the (BRS)

A. gap junctions
B. T tubules
C. sarcoplasmic reticulum (SR)
D. intercalated disks
E. mitochondria

A ✓
B
C
D
E

17. cardiac muscle cell differ from skeletal cell: (test bank 020)

A. Poor in mitochondria
B. Have more t tubules per sarcomere
C. Cardiac rest length is less than its optimal

A
B
C ✓

18. all of the following regarding skeletal and cardiac muscles is correct EXCEPT: (test bank 020)

A. Skeletal muscles have more developed sarcoplasmic reticulum
B. Gap junction are only found in cardiac muscle
C. Nuclei are much less in skeletal muscles than in cardiac muscles
D. There are larger and shorter t tubules in skeletal muscles than in cardiac muscles

- ○ A
- ○ B
- ✓ ~~C~~
- ✓ ~~D~~

19. the slowest conduction: (test bank 020)

A. SA node
B. AV node
C. Ventricle muscle
D. Purkinje fiber

- ○ A
- ✓ ~~B~~
- ○ C
- ○ D