

Ch.9 "CVS Ques."

1. Adjacent cardiac muscle cells are joined together end-to-end in the ventricles by
(a)+ intercalated discs.
(b) sarcomeres.
(c) Purkinje fibers.
(d) sinoatrial nodes.
(e) atrioventricular nodes.

2. What component of the cardiac conduction system distributes electrical signals through the papillary muscles directly?
(a) AV nodes.
(b) AV bundle.
(c) bundle of His.
(d)+ Purkinje fibers.
(e) SA node.

3. The plateau of the cardiac action potential results from the opening of voltage-gated slow _____ channels in the plasma membrane of the cardiac cell.
(a) sodium
(b) potassium
(c)+ calcium
(d) chloride
(e) glucose

4. Which of the following statements concerning action potentials in the heart is correct?
(a) The rising phase of the action potential in cardiac autorhythmic cells is due to a rapid Ca^{2+} influx.
(b) The rising phase of the action potential in cardiac contractile cells is due to a rapid Na^{+} influx.
(c) The plateau phase of the action potential in cardiac contractile cells is due to a slow Ca^{2+} influx.
(d) Two of these answers are correct.
(e)+ All of these answers are correct.

5. Why can't tetany of the heart occur?
(a) there are no distinct motor units in the heart.
(b) there is inadequate oxygen supply via the coronary circulation to metabolically support a sustained contraction.
(c)+ the refractory period in cardiac muscle lasts almost as long as the duration of the resultant contraction.
(d) the heart contracts with maximal force every beat so it is impossible to increase the strength of cardiac contraction.
(e) vagal stimulation slows down the heart rate to prevent summation of contractions.

6. What percentage of ventricular filling is normally accomplished before atrial contraction begins?

- (a) 0%
- (b) 20%
- (c)+** 80%
- (d) 50%
- (e) 100%

7. The aortic valve opens

- (a)+** when ventricular pressure exceeds aortic pressure.
- (b) at the start of systole.
- (c) at the maximum ventricular pressure.
- (d) immediately after atrial contraction.
- (e) none of these answers.

8. Cardiac output

- (a) is the volume of blood pumped by each ventricle during each contraction or beat.
- (b) is the volume of blood pumped by each ventricle per minute.
- (c) equals heart rate x stroke volume.
- (d) both (a) and (c) above.
- (e)+** both (b) and (c) above

9. If the cardiac output is 4,800 ml/min and the heart rate is 60 beats per minute, the stroke volume averages _____ ml.

- (a) 60
- (b) 70
- (c)+** 80
- (d) 120
- (e) 140

10. Blood flow through the coronary circulation occurs

- (a) mainly during systole.
- (b)+** mainly during diastole.
- (c) almost equally during systole and diastole.
- (d) only during ventricular isovolumetric contraction.
- (e) none of these answers.

11. which statements isn't correct about the cvs :

- (a) Sympathetic stimulation increases the heart rate
- (b) Sympathetic stimulation of the heart increases calcium permeability.
- (c)** Parasympathetic stimulation of the AV node increases the speed of transmission of the impulse through the AV node.

(d) One important function of the intrinsic control of the heart (Frank-Starling law of the heart) is to maintain the left and right cardiac outputs in balance.

12. The cardiac output is equal to
- (a)+ the difference between the end_diastolic volume (EDV) and the end_systolic volume (ESV) x HR.
 - (b) the product of heart rate and EDV.
 - (c) the difference between the stroke volume at rest and the stroke volume during exercise.
 - (d) the stroke volume less the end_systolic volume.
 - (e) the product of heart rate and blood pressure.
13. If the connection between the SA node and AV node becomes blocked
- (a) the ventricles will beat faster.
 - (b)+ the ventricles will beat more slowly.
 - (c) the ventricular rate of contraction will not be affected.
 - (d) the stroke volume will increase.
 - (e) tachycardia will occur.
14. On a normal ECG, a wave for repolarization of the atria is not recorded. Why?
- (a) the leads are not placed in a position to pick it up.
 - (b) no repolarization of the atria occurs normally.
 - (c) it occurs simultaneously with ventricular depolarization and is masked by the QRS complex.
 - (d) it does not travel through body fluids.
 - (e) it is too small to be picked up by external recording electrodes.

ANSWER: c

15. The electrocardiogram is most useful in determining which component of cardiac output?
- (a) stroke volume
 - (b) heart rate
 - (c) ejection fraction
 - (d) end-diastolic volume
 - (e) murmurs

ANSWER: b

16. If the connection between the SA node and AV node becomes blocked
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ANSWER: b

17. The heart valves open and close due to

- (a) attachment to the heart muscle.
- (b) a pressure difference on the two sides of the valve.
- (c) Na^+ and K^+ fluxes during ventricular depolarization.
- (d) turbulent flow in the atria and ventricles.
- (e) none of these answers.

ANSWER: b

18. The end-systolic volume is

- (a) the volume of blood in the ventricle when ejection is complete.
- (b) the volume of blood in the ventricle when filling is complete.
- (c) always equal to the stroke volume.
- (d) the volume of blood in the ventricle when ejection is complete and always equal to the stroke volume.
- (e) the volume of blood in the ventricle when filling is complete and always equal to the stroke volume.

ANSWER: a

19. Twelve complete ECG patterns are recorded from a subject over ten seconds. If this pattern continues, the rate of the heartbeat in the subject is _____ beats per minute.

- (a) 60
- (b) 72
- (c) 90
- (d) 108
- (e) 120

ANSWER: b

20. According to the Frank-Starling law of the heart,

- (a) the shorter the initial length of the cardiac muscle fibers prior to contraction the more forceful will be the subsequent contraction, because the fibers are already partially contracted.
- (b) increasing the venous return increases the end-diastolic volume, which leads to an increased stroke volume, so the heart normally pumps out all of the blood returned to it.
- (c) as cardiac output is reduced, blood pools in the vasculature so that arterial blood pressure increases.
- (d) the output of the left side of the heart must always exceed that of the right side of the heart because the right side only pumps blood to the lungs, whereas the left side must pump blood to the rest of the body.
- (e) the greater the stroke volume, the smaller will be the subsequent end-diastolic volume because as more blood is squeezed out, the heart cannot fill as completely.

ANSWER: b

21. On a normal ECG, a wave for repolarization of the atria is not recorded. Why?
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 - (e) it is too small to be picked up by external recording electrodes.

ANSWER: c

22. The QRS complex represents
- (a) depolarization of the atria.
 - (b) depolarization of the ventricles.
 - (c) the AV nodal delay.
 - (d) repolarization of the ventricles.
 - (e) the time during which the heart is contracting.

ANSWER: b

23. Electrical activity occurs at the AV node
- (a) during the P wave.
 - (b) between the P wave and QRS complex.
 - (c) during the QRS complex.
 - (d) between the QRS complex and T wave.
 - (e) during the T wave.

ANSWER: b

24. Which of the following ECG waves represents ventricular repolarization?
- (a) P wave.
 - (b) QRS complex.
 - (c) T wave.
 - (d) PR segment.
 - (e) ventricular repolarization occurs simultaneously with atrial depolarization and consequently cannot be recorded.

ANSWER: c

25. Depolarization of the ventricles is represented on an electrocardiogram by the
- (a) P wave.
 - (b) T wave.
 - (c) S wave.
 - (d) QRS complex.

(e) PR complex.

ANSWER: d

26. All of the following negatively influence the myocardium's contractility, thus increasing ESV except

- (a) acetylcholine.
- (b) preload.
- (c) afterload.
- (d) parasympathetic activity.
- (e) vagal activity.

ANSWER: b

27. When the heart is sympathetically stimulated

- (a) ESV will increase.
- (b) acetylcholine is released from neuron.
- (c) norepinephrine is released from neurons.
- (d) Ca^{2+} channels open in greater numbers
- (e) both (c) and (d) above.

ANSWER: e

28. If the EDV were held constant, increased stroke volume could be accomplished by

- (a) increased sympathetic nerve activity to the heart.
- (b) increased parasympathetic nerve activity to the heart.
- (c) decreased contractility.
- (d) sleep.
- (e) increased arterial blood pressure.

ANSWER: a

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