EKG Technician

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Practice Questions

Try all 30 first, then check the answer key at the back.

1. Which structure is normally the primary pacemaker of the heart?

A. The sinoatrial (SA) node
B. The atrioventricular (AV) node
C. The bundle of His
D. The Purkinje fibers

2. Where is the V1 chest electrode placed?

A. Fourth intercostal space at the left sternal border
B. Fourth intercostal space at the right sternal border
C. Fifth intercostal space at the midclavicular line
D. Second intercostal space at the right sternal border

3. Which feature is characteristic of normal sinus rhythm?

A. An irregular rhythm with no P waves
B. A rate above 150 bpm
C. A wide QRS with no P waves
D. A regular rhythm with a P wave before every QRS at 60-100 bpm

4. A premature ventricular contraction (PVC) is characterized by:

A. An early, wide, bizarre QRS with no preceding P wave
B. An early narrow QRS with a normal P wave
C. A late escape beat
D. A sawtooth baseline

5. On standard EKG paper, each small box represents how much time horizontally?

A. 0.20 second
B. 0.10 second
C. 0.04 second
D. 1.0 second

6. A jagged, irregular, fuzzy baseline caused by patient shivering or tremor is called:

A. Wandering baseline
B. Sixty-cycle interference
C. A pacemaker spike
D. Somatic (muscle) tremor artifact

7. The disposable adhesive sensors that attach to the patient's skin to detect electrical activity are called:

A. Lead wires
B. Electrodes
C. Calipers
D. Defibrillator pads only

8. Before performing an EKG, the technician should first:

A. Begin recording immediately to save time
B. Verify the patient's identity using two identifiers
C. Remove all electrodes from a previous patient's chart
D. Interpret the rhythm before connecting leads

9. Which chambers of the heart receive blood returning to the heart?

A. The ventricles
B. The septa
C. The atria
D. The valves

10. Where is the V2 chest electrode placed?

A. Fourth intercostal space at the left sternal border
B. Fourth intercostal space at the right sternal border
C. Fifth intercostal space at the left sternal border
D. Midaxillary line at the fifth intercostal space

11. Sinus bradycardia is defined as a sinus rhythm with a rate:

A. Above 100 beats per minute
B. Below 60 beats per minute
C. Between 100 and 150 beats per minute
D. Above 150 beats per minute

12. Ventricular tachycardia is defined as:

A. Three or more atrial beats at a slow rate
B. A single premature atrial beat
C. An irregular rhythm with no QRS complexes
D. Three or more consecutive ventricular beats at a rapid rate

13. On standard EKG paper, each large box represents how much time horizontally?

A. 0.20 second
B. 0.04 second
C. 0.10 second
D. 0.50 second

14. Fine, uniform, regular spikes appearing throughout the tracing at a fixed frequency are most likely:

A. Muscle tremor
B. Wandering baseline
C. Sixty-cycle (AC electrical) interference
D. A pacemaker rhythm

15. In EKG terminology, the term 'lead' refers to:

A. The adhesive sensor on the skin
B. The power cord of the machine
C. The paper used for printing
D. A view of the heart's electrical activity from a specific angle

16. Explaining the EKG procedure to the patient beforehand mainly helps to:

A. Increase the heart rate intentionally
B. Replace the need for consent
C. Speed up the paper
D. Reduce anxiety and gain cooperation

17. The brief delay of the electrical impulse at the AV node primarily allows time for what to occur?

A. The ventricles to repolarize before contracting
B. Ventricular filling as the atria contract
C. The SA node to reset its rate
D. Blood to enter the coronary arteries

18. Where is the V4 chest electrode placed?

A. Fourth intercostal space at the left sternal border
B. Fifth intercostal space at the anterior axillary line
C. Fifth intercostal space at the left midclavicular line
D. Fifth intercostal space at the midaxillary line

19. Sinus tachycardia is defined as a sinus rhythm with a rate:

A. Above 100 beats per minute
B. Below 60 beats per minute
C. Below 40 beats per minute
D. Exactly 60 beats per minute

20. Ventricular fibrillation appears on the EKG as:

A. A regular sawtooth pattern
B. A chaotic, irregular waveform with no identifiable QRS complexes
C. A slow regular wide-complex rhythm
D. Normal complexes with dropped beats

21. Five large boxes on standard EKG paper represent how much time?

A. 0.20 second
B. 0.50 second
C. 2.0 second
D. 1.0 second

22. A slow, smooth up-and-down drifting of the baseline is described as:

A. Wandering baseline
B. Sixty-cycle interference
C. Muscle tremor
D. Failure to capture

23. The heated pen-like component that traces the waveform onto thermal EKG paper is the:

A. Electrode
B. Caliper
C. Stylus
D. Galvanometer reset

24. Protecting patient privacy during an EKG includes:

A. Discussing results loudly in the hallway
B. Leaving the door open during the test
C. Draping the patient and keeping their information confidential
D. Posting the tracing publicly

25. Which valve separates the left atrium from the left ventricle?

A. The tricuspid valve
B. The aortic valve
C. The pulmonic valve
D. The mitral (bicuspid) valve

26. Lead V6 is placed at the fifth intercostal space at the:

A. Midclavicular line
B. Midaxillary line
C. Anterior axillary line
D. Posterior axillary line

27. A sinus rhythm in which the rate increases with inspiration and decreases with expiration is called:

A. Atrial fibrillation
B. Sinus arrest
C. Sinus arrhythmia
D. Atrial flutter

28. Ventricular fibrillation requires immediate:

A. Defibrillation and CPR
B. Observation only
C. Slowing of the paper speed
D. A 12-lead repeat before acting

29. On standard EKG paper with normal calibration, each small box vertically represents:

A. 1.0 millivolt
B. 0.1 millivolt (1 mm)
C. 0.5 millivolt
D. 0.04 second

30. To correct 60-cycle interference, the technician should first:

A. Warm the patient with a blanket
B. Reattach loose limb electrodes
C. Increase the paper speed
D. Identify and move or unplug nearby electrical devices and check grounding

Answer Key & Explanations

1. A — The sinoatrial (SA) node
The SA node in the right atrium has the fastest intrinsic rate (about 60-100 beats per minute) and therefore sets the normal heart rhythm, called sinus rhythm.

2. B — Fourth intercostal space at the right sternal border
V1 is positioned in the fourth intercostal space just to the right of the sternum; V2 is the mirror position on the left.

3. D — A regular rhythm with a P wave before every QRS at 60-100 bpm
Normal sinus rhythm has upright P waves preceding each QRS, regular R-R intervals, and a rate of 60-100 bpm originating from the SA node.

4. A — An early, wide, bizarre QRS with no preceding P wave
A PVC originates in the ventricle, so it appears early, has a wide and abnormally shaped QRS, and is not preceded by a related P wave.

5. C — 0.04 second
At the standard speed of 25 mm/sec, each 1 mm small box equals 0.04 second; five small boxes make one large box of 0.20 second.

6. D — Somatic (muscle) tremor artifact
Muscle movement produces erratic spikes superimposed on the tracing; warming the patient or repositioning often reduces this somatic artifact.

7. B — Electrodes
Electrodes pick up the heart's electrical signals from the skin; the lead wires then carry those signals to the EKG machine.

8. B — Verify the patient's identity using two identifiers
Confirming identity with two identifiers (such as name and date of birth) ensures the EKG is performed on and recorded for the correct patient.

9. C — The atria
The atria are the upper receiving chambers; the right atrium receives deoxygenated blood from the body and the left atrium receives oxygenated blood from the lungs.

10. A — Fourth intercostal space at the left sternal border
V2 is placed in the fourth intercostal space at the left edge of the sternum, directly across from V1.

11. B — Below 60 beats per minute
Sinus bradycardia has all the features of normal sinus rhythm but a rate under 60 bpm; it may be normal in well-conditioned athletes.

12. D — Three or more consecutive ventricular beats at a rapid rate
Ventricular tachycardia is a run of three or more wide, fast ventricular complexes; sustained VT is a medical emergency.

13. A — 0.20 second
One large box contains five small boxes; 5 times 0.04 second equals 0.20 second at the standard paper speed.

14. C — Sixty-cycle (AC electrical) interference
Alternating-current interference from nearby electrical equipment produces a uniform, regular 60 Hz pattern; unplugging or moving devices usually corrects it.

15. D — A view of the heart's electrical activity from a specific angle
A lead is a recorded view created by comparing electrode signals, whereas an electrode is the physical sensor; the 12-lead EKG provides 12 views.

16. D — Reduce anxiety and gain cooperation
A clear explanation eases patient anxiety, encourages stillness, and improves cooperation, which leads to a better-quality tracing.

17. B — Ventricular filling as the atria contract
The AV node delays conduction so the atria finish contracting and fill the ventricles before ventricular contraction, optimizing stroke volume.

18. C — Fifth intercostal space at the left midclavicular line
V4 sits in the fifth intercostal space at the midclavicular line; V5 and V6 are placed horizontally level with V4.

19. A — Above 100 beats per minute
Sinus tachycardia retains normal P waves and conduction but the SA node fires faster than 100 bpm, often due to exercise, fever, or stress.

20. B — A chaotic, irregular waveform with no identifiable QRS complexes
In ventricular fibrillation the ventricles quiver instead of contracting, producing a disorganized waveform with no true QRS and no effective output.

21. D — 1.0 second
Each large box is 0.20 second, so five large boxes equal 1.0 second; this is why 300 large boxes equal one minute.

22. A — Wandering baseline
Wandering baseline is a gradual rise and fall of the tracing, often from patient breathing, loose electrodes, or lotion on the skin.

23. C — Stylus
The stylus marks the moving thermal paper to draw the EKG waveform; its position reflects the amplified electrical signal.

24. C — Draping the patient and keeping their information confidential
Maintaining modesty with proper draping and safeguarding health information respects patient dignity and complies with privacy standards.

25. D — The mitral (bicuspid) valve
The mitral valve, with two leaflets, lies between the left atrium and left ventricle and prevents backflow during ventricular contraction.

26. B — Midaxillary line
V6 is located in the same horizontal plane as V4 and V5 but at the midaxillary line, the most lateral of the standard chest leads.

27. C — Sinus arrhythmia
Sinus arrhythmia is a normal, often benign variation in rate tied to the breathing cycle; P waves and conduction remain normal.

28. A — Defibrillation and CPR
Ventricular fibrillation is a non-perfusing rhythm; survival depends on prompt CPR and defibrillation to restore an organized rhythm.

29. B — 0.1 millivolt (1 mm)
Vertically, the EKG measures voltage; with standard calibration each 1 mm small box equals 0.1 mV, so 10 mm equals 1 mV.

30. D — Identify and move or unplug nearby electrical devices and check grounding
Because 60-cycle artifact comes from AC electrical sources, removing or distancing other powered equipment and ensuring proper grounding usually eliminates it.

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