Sikkim Public Service Commission

Main Written Examination for the Post of ECG Technician under Sikkim State Subordinate Allied and Healthcare Service

PAPER -II

Time allowed: 3.00 Hrs

Maximum Marks: 100

INSTRUCTIONS TO CANDIDATES

Read the instructions carefully before answering the questions: -

1. **IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS BOOKLET DOES NOT HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.**
2. **Use only Black Ball Point Pen to fill the OMR Sheet.**
3. Do not write anything else on the OMR Answer Sheet except the required information.
4. **This Test Booklet contains 50 questions in MCQ Mode in Part I to be marked in OMR Sheet. Part II and Part III are Subjective Questions which have to be written on separate answer sheet provided to you.**
5. Before you proceed to mark in the Answer Sheet (OMR), you have to fill in some particulars in the Answer Sheet (OMR) as per given instructions.
6. After you have completed filling in all your responses on the Answer Sheet (OMR) and the examination has concluded, you should hand over the Answer Sheet (OMR) and separate answer sheet to the Invigilator only. You are permitted to take with you the Test Booklet.
7. **Marking Scheme**

   THERE WIL BE NEGATIVE MARKING FOR WRONG ANSWERS MARKED BY A CANDIDATE IN THE OBECTVE TYPE QUESTION PAPERS

   i. There are four alternatives for the answer to every question. For each question for which a wrong answer has been given by the candidate, one-third of the marks assigned to the question will be deducted as penalty.
   ii. If a candidate gives more than one answer, it will be treated as a wrong answer even if one of the given answers happens to be correct and there will be same penalty as above to the question.
   iii. If a question is left blank. i.e., no answer is given by the candidate, there will be no penalty for that question.

DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO

PART - I

Choose the correct answer for the following questions: **(1x50=50)**

1. **One small square on an EKG is equivalent to how much time (andwhat distance)?**
   A. 0.04 sec (2mm)
   B. 0.20 sec (1mm)
   C. .04 sec (1mm)
   D. .01 sec (1mm)

2. **One large square is equal to what amount of time (and distance) on EKG?**
   A. 2 sec/.5mm
   B. 20 sec/5 mm
   C. 0.02 sec/0.5mm
   D. 0.2 sec/5mm

3. **What leads are considered inferior leads?**
   A. II, III, aVF
   B. II, III, aVR
   C. I,II,III
   D. V1,II

4. **What leads are considered (left) lateral leads?**
   A. I,aVR
   B. I,aVL
   C. V5,V6
   D. II,III

5. **Choose the correct placement of V1:**
   A. 5th right intercostal space
   B. V2
   C. 4th right intercostal space
   D. Where the sun doesn't shine

6. **Name the correct placement of V2:**
   A. 4th left intercostal space
   B. 4th right intercostal space
   C. 5th left intercostal space
   D. 5th right intercostal space

7. **Name the placement for V4**
   A. Who cares?
   B. 5th intercostal space, anterior axillary line
   C. 5th intercostal space, midclavicular line
   D. 5th intercostal space, midaxillary line

8. **What view of the heart does V1-V4 give?**
   A. Anterior
   B. Posterior
   C. Lateral
   D. Exterior

9. **What view of the heart does V5-V6 give?**
   A. Left lateral view
   B. Right lateral view
   C. Mid axillary view
   D. Apical view

10. **Normal duration and Normal amplitude of P wave is?**
   A. The duration of P wave is no greater than **0.18sec**; the maximal normal amplitude is 2.8mm
   B. The duration of P wave is no greater than **0.22sec**; the maximal normal amplitude is 3.5mm
   C. The duration of P wave is no greater than **0.11sec**; the maximal normal amplitude is 2.5mm
   D. The duration of P wave is no greater than **0.30sec**; the maximal normal amplitude is 4.5mm

11. **In which lead is the P wave best seen?**
   A. II
   B. III
   C. AvF
   D. V1

12. **In which leads would you see a positive P wave?**
   A. I, II, III
   B. AVL, AVF, V4-V6
   C. V4-V6
   D. I, II, AVL, AVF, V4-V6

13. **In which lead would you see a BIPHASIC P wave?**
   A. V2-V3
   B. V5-V6
   C. V1
   D. V3

14. What is the normal length in PR interval in both seconds and mm?

A. 0.12 to 0.18 seconds (3-5mm)
B. 0.12 to 0.20 seconds (3-5 mm)
C. 0.20 to 0.30 seconds(3-5mm)
D. 0.18 to 1.06 seconds(3-5mm)

15. Normal duration of QRS complex?

A. 0.06 to 0.10 seconds
B. 0.04 to 0.90 seconds
C. 0.08 to 1.35 seconds
D. 1.00 to 2.00 seconds

16. Regarding the QRS complex: In which leads would you see a Deep S wave?

A. V1
B. V1, V2
C. V3, v4
D. V5,v6

17. Regarding the QRS complex: In which lead(s) would you see a TALL R wave?

A. V5
B. V6
C. V1,V2
D. V5,V6

18. Regarding the QRS complex: In which lead(s) would you see a biphasic complex, reflection a "transition zone"?

A. V1,V2
B. V2,V3
C. V3, V4
D. V4,V5

19. In what leads do you see an "R wave progression"?

A. V1 to v6
B. V2 to v4
C. V5 to v6
D. V1 to v4

20. What part of the EKG is known as the "plateau phase", and represents the initial part of ventricular repolarization?

A. S Wave
B. ST Segment
C. PR interval
D. QRS complex

21. What segment, if elevated or depressed, reveals a sign of serious pathology?

A. ST
B. PR
C. R-R
D. QT

22. What wave represents ventricular repolarization?

A. U wave
B. P wave
C. Q wave
D. T wave

23. Which of the following best represents the normal height of the T WAVE?

A. 1/2-2/3 height of corresponding R wave
B. 1/3-2/3 height of corresponding R wave
C. 1/3-2/3 height of corresponding T wave
D. 1/2-2/3 height of corresponding T wave

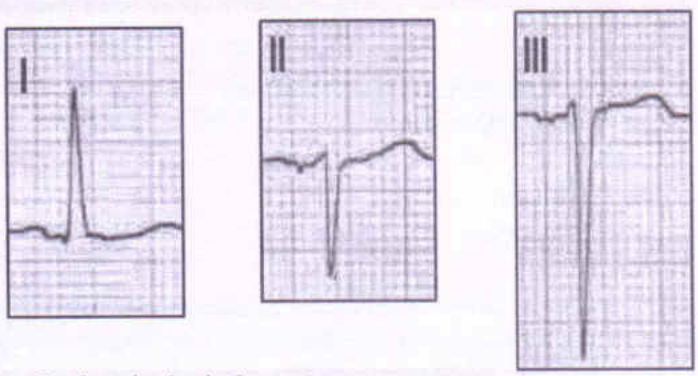
24. What portion of the EKG represents the duration of ventricular systole?

A. QT interval
B. PR segment
C. QRS complex
D. ST segment

25. The QT interval varies with heart rate, and thus must be corrected. This corrected QT interval is also abbreviated as (QTc). This value is considered normal when it's less than half of the _____ interval at normal rates.

A. P-R
B. Q-R
C. R-R
D. P-P

26. What would it suggest if lead I became more positive than lead II and lead III became negative?

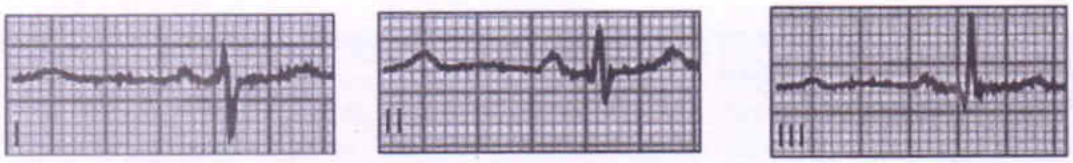


a. Left axis deviation
b. Right axis deviation
c. Normal axis deviation
d. Lateral axis deviation

27. If a rhythm is described as sinus, what does this indicate?

A. P-waves are present
B. A P-wave precedes each QRS-complex
C. A QRS-complex precedes each T-wave
D. QRS-complexes are present

28. What would it suggest if lead I became negative and lead III became more positive than lead II?



A. Left axis deviation
B. Right axis deviation
C. Normal axis deviation
D. Lateral axis deviation

29. What is the normal duration of a QRS complex?

A. 0.16 seconds (4 small squares)
B. 0.08 seconds (2 small squares)
C. 0.04 seconds (1 small square)
D. 0.12 seconds (3 small squares)

30. What does ST-elevation suggest?

A. Bundle Branch Block
B. Heart murmur
C. Heart block - Mobitz type II
D. Myocardial infarction

31. What is the most common cause of left axis deviation?

A. Defects of the conduction system
B. Atrial septal defects
C. Left ventricular hypertrophy
D. Right ventricular hypertrophy

32. The duration of the PR interval is noted to be increasingly prolonged. In addition, QRS complexes appear to be dropped at regular intervals. What diagnosis would this suggest.

A. Second degree - Mobitz Type 2 - Heart Block
B. First degree Heart Block
C. Hyperkaliemia
D. Second degree - Mobitz Type 1 - Heart Block

33. What is the duration of a normal PR-interval?

A. 0.12 - 0.2 seconds (3-5 small squares)
A. 0.04 - 0.08 seconds (1-2 small squares)
B. 0.04 - 0.12 seconds (1-3 small squares)
C. 0.08 -0.12 seconds (2-3 small squares)

34. If ST-elevation was noted in leads II, III and aVF what would it suggest?

A. An anterior myocardial infarction
B. An inferior myocardial infarction
C. A septal myocardial infarction
D. A posterior myocardial infarction

35. Which artery is most likely to be affected if ST elevation in present in leads V3 and V4?

A. Left circumflex coronary artery
B. Right coronary artery
C. Left anterior descending coronary artery
D. All of the above

36. The absence of P-waves and an irregular rhythm would suggest a diagnosis of...

A. Atrial fibrillation
B. 1st degree heart block
C. 2nd degree heart block
D. Ventricular tachycardia

37. What view of the heart do leads I, aVL, V5 and V6 represent?

A. Inferior
B. Lateral
C. Anterior
D. Septal

38. What is a common cause of right axis deviation?

A. Right ventricular hypertrophy
B. Atrial septal defect
C. Left ventricular hypertrophy
D. Ventricular septal defect

39. What is often the earliest ECG change seen during myocardial infarction?

A. ST-depression
B. Tall peaked T-waves
C. ST-elevation
D. Tall P-waves

40. A patient is noted to have an abnormally shortened PR-interval on their ECG. Which of the following is the most likely cause?

A. Wolf Parkinson White Syndrome
B. AV nodal fibrosis
C. Left bundle branch block
D. Right bundle branch block

41. Premature atrial beat is every other beat

A. Atrial Bigeminy
B. Atrial Trigeminy
C. Ventricle Bigeminy
D. Ventricle Trigeminy

42. What would cause an inverted P-wave immediately before premature QRS?

A. Premature junctional beat causing retrograde atrial depolarization
B. Premature junctional beat causing retrograde atrial repolarization
C. Premature atrial beat causing retrograde atrial depolarization
D. Complete heart block

43. The rate of Paroxysmal tachycardia is typically:

A. 350+ bpm
B. 150-250 bpm
C. 150-300 bpm
D. 250-350 bpm

44. What would you typically see on EKG if a patient had Bundle Branch Block?

A. Wide QRS
B. Narrow QRS
C. Spiked PR interval
D. Absent P-wave

45. What is the best lead for determining RAD?

A. Lead II
B. Lead III
C. Lead I
D. Lead aVF

46. If you see a patient with a positive QRS in lead I, and a negative QRS in lead aVF, what sort of axis do they have?

A. LAD
B. RAD
C. Normal axis
D. Extreme right axis deviation

47. Which would you expect to see on EKG of a patient with normal axis?

A. Positive QRS in V1; negative QRS in Lead I
B. Positive QRS in lead I, positive QRS in lead AVF
C. Negative QRS in lead I, positive QRS in lead AVF
D. Negative QRS in V6, negative QRS in lead II

48. ST segment elevation is a sign of:

A. Acute ischemic injury
B. COPD
C. Previous MI
D. Heart transplant

49. If you see that the ST segment is elevated, flat or concave elevation AND the entire T wave is elevated off baseline, what disease would most likely be happening?

A. Acute Ischemia
B. Pericarditis
C. Forgot to take daily Lithium
D. Pleural effusion

50. You would typically see a peaked, tent like T wave in what condition?

A. Hyperkalemia
B. Hypokalemia
C. Hyperkalemia
D. Hyponatremia

PART - II

Write short notes on<u>ANY FOUR</u> of the following: **(5x4=20)**

1. How does a DEFIBRILLATOR work?
2. How does Right Bundle Branch Block (RBBB) wavesreflect on ECG?
3. What isTACHYCARDIA?
4. What is PACING THRESHOLD?
5. What is BIGEMINY on ECG?
6. What does QRS stand for? What does QRSCOMPLEXrepresent?

PART – III

Answer <u>ANY TWO</u> of the following: **(15x2=30)**

1.What is the electrophysiology EP study of heart?

2.Define the electrical axis of heart?

3.ECG waveforms changes in WPW syndrome?

4.Define ECG findings in different myocardial infarctions?