B.Sc. CARDIAC TECHNOLOGY
(New Syllabus 2014-2015)

SECOND YEAR

PAPER II – ADVANCED ECG AND TREADMILL EXERCISE STRESS TESTING AND 24 HOUR AMBULATORY ECG AND BP RECORDING

Q.P. Code : 801532

Time: Three Hours   **Maximum: 100 Marks**

Answer all questions

I. Elaborate on: **(3 x 10 = 30)**

1. How will you identify ventricular tachycardia?
2. Discuss the indications, contraindications and precautions while doing treadmill test.
3. Discuss about localization of ischemia / infarction based on ECG.

II. Write Notes on: **(8 x 5 = 40)**

1. Discuss about ECG changes in hyperkalemia.
2. Discuss about primary and secondary T wave change.
3. Describe the progression of ECG changes in Acute myocardial infarction.
4. Discuss about LQTS.
5. Discuss about Estes criteria.
6. Discuss about Mobitz type I and II block.
7. Normal segments and intervals in ECG.
8. How will you diagnose supraventricular tachycardia?

III. Write Notes on: **(10 x 3 = 30)**

1. Modified Chest leads.
2. Modified Bruce protocol.
3. Discuss about U waves.
4. Enumerate three points to diagnose Left Ventricular Hypertrophy.
5. Enumerate three points to diagnose a malignant VPC.
6. Discuss the applications of Holter.
7. Enumerate the ECG findings in right ventricular hypertrophy.
8. Draw LBBB ECG and list the changes to diagnose the same.
9. List three causes for tall T waves.
10. How will WPW syndrome manifest in ECG?

******

B.Sc. CARDIAC TECHNOLOGY
(New Syllabus 2014-2015)

SECOND YEAR

**PAPER II – ADVANCED ECG AND TREADMILL EXERCISE
STRESS TESTING AND 24 HOUR AMBULATORY ECG AND
BP RECORDING**

Q.P. Code : 801532

Time: Three Hours   **Maximum: 100 Marks**
Answer all questions

I. Elaborate on: (3 x 10 = 30)

1. Discuss the ECG findings in ventricular tachycardia. How will you differentiate between ventricular tachycardia and supraventricular tachycardia?
2. How will you set a stress test laboratory? What are the precautions you will take during the test?
3. Discuss about the various types of Heart block.

II. Write Notes on: (8 x 5 = 40)

1. Discuss about ECG changes in hypokalemia.
2. Discuss about monophasic and biphasic shock.
3. How will you diagnose LVH?
4. Discuss about QT prolongation and its causes.
5. Discuss about ventricular Fibrillation.
6. Discuss about various ECG changes in exercise testing.
7. Normal segments and intervals in ECG.
8. How will Left circumflex infarction manifest on ECG?

III. Write Notes on: (10 x 3 = 30)

1. Biatrial enlargement.
2. Modified Bruce protocol.
3. Connections of Holter.
4. Enumerate three points to diagnose RVH.
5. Enumerate three points to diagnose a malignant VPC.
6. Discuss the applications of Holter.
7. Enumerate the ECG findings in Left anterior hemiblock.
8. Non infarction Q waves.
9. Draw an ECG showing Atrial flutter and mark the salient features.
10. What is the difference between defibrillation and cardioversion?

******

B.Sc. CARDIAC TECHNOLOGY

SECOND YEAR

PAPER II – ADVANCED ECG AND TREADMILL EXERCISE STRESS TESTING AND 24 HOUR AMBULATORY ECG AND BP RECORDING

Q.P. Code: 801532

Time: Three Hours   **Maximum: 100 Marks**

Answer all questions

I. Elaborate on: **(3 x 10 = 30)**

1. Draw a normal ECG and explain changes in acute MI, how do you identify the coronary artery involvement?

2. Indications for holter, type of arrhythmias which can be detected by holter.

3. Various protocol in TMT and explain in detail about any one protocol.

II. Write notes on: **(8 x 5 = 40)**

1. Criteria for RVH.
2. 24 hours ambulatory Bp monitoring.
3. ECG features of AWMI.
4. WPW syndrome.
5. Indications and contraindications for TMT.
6. Ventricular arrhythmias.
7. ECG in various metabolic abnormalities.
8. LBBB and RBBB.

III. Short answers on: **(10 x 3 = 30)**

1. P mitrale.
2. T-waves in ECG.
3. ECG features of hypokalemia.
4. Atrial arrhythmias.
5. Absolute contraindication of TMT.
6. LAHB.
7. ECG features of TOF.
8. Digoxin toxicity.
9. DC shock.
10. Causes for right axis deviation.

****

B.Sc. CARDIAC TECHNOLOGY

SECOND YEAR

PAPER II – ADVANCED ECG AND TREADMILL EXERCISE STRESS TESTING AND 24 HOUR AMBULATORY ECG AND BP RECORDING

Q.P. Code: 801532

Time: Three Hours   **Maximum: 100 Marks**

Answer all questions

I. Elaborate on: **(3 x 10 = 30)**

1. Normal QRS axis and explain in detail about various QRS axis deviations and its causes.
2. Explain in detail about indication, contraindication and protocols of TMT.
3. Indications for 24 hours BP monitoring and its procedure.

II. Write notes on: **(8 x 5 = 40)**

1. P waves anomalies in ECG.
2. ECG criteria for RVH.
3. ECG features for digoxin toxicity.
4. Various types of holter monitoring and abnormalities in holter.
5. Metabolic changes in ECG.
6. Types of heart block.
7. Causes for 't' wave inversion in ECG.
8. Normal Qt interval and various anamolies in Qt interval.

III. Short answers on: **(10 x 3 = 30)**

1. RBBB.
2. LAHB and LPHB.
3. U wave in ECG.
4. Himalayan P wave.
5. ECG features of mitral stenosis.
6. Atrial flutter.
7. SVT.
8. Ventricular ectopics.
9. PR interval and abnormalities.
10. Draw Einthoven triangle.

****

B.Sc. CARDIAC TECHNOLOGY
SECOND YEAR
PAPER II – ADVANCED ECG AND TREADMILL EXERCISE STRESS TESTING AND 24 HOUR AMBULATORY ECG AND BP RECORDING

Q.P. Code: 801532

Time: Three Hours   **Maximum: 100 Marks**

Answer all questions

I. Elaborate on: (3 x 10 = 30)

1. ECG changes in acute MI and Delineation of coronary artery involvement.

2. Indications and contra indications in TMT.

3. Draw the conduction system and explain in detail about various types of heart blcok.

II. Write notes on: (8 x 5 = 40)

1. Indications for holter analysis.
2. WPW syndrome.
3. Long QT syndrome.
4. Modified bruce protocol.
5. Indications for 24 Hrs BP monitoring.
6. P-wave abnormalities.
7. Causes of LAD in ECG.
8. LVH criteria.

III. Short answers on: (10 x 3 = 30)

1. Digitalis toxicity.
2. ECG features of hyperkalemia.
3. ECG features of acute PTE.
4. Atrial flutter.
5. Himalayan P waves.
6. Epsilon waves.
7. Q-waves.
8. ECG paper speed.
9. RAD.
10. LAHB.

****

B.Sc. CARDIAC TECHNOLOGY
SECOND YEAR
PAPER II – ADVANCED ECG AND TREADMILL EXERCISE STRESS TESTING AND 24 HOUR AMBULATORY ECG AND BP RECORDING

Q.P. Code: 801532

Time: Three Hours   **Maximum: 100 Marks**
Answer all questions

I. Elaborate on: **(3 x 10 = 30)**

1. Explain in detail about various protocols in TMT and indications for TMT.
2. Indications for holter analysis and write briefly about PPI.
3. Write an essay on Localization of Ischemia using ECG.

II. Write notes on: **(8 x 5 = 40)**

1. Causes of LAD in ECG.
2. Einthoven triangle.
3. SVT.
4. 24 Hrs BP monitoring.
5. LAHB and LPHB.
6. Sensitivity and specificity of stress test.
7. ECG changes in Hyperkalemia.
8. Sick sinus syndrome.

III. Short answers on: **(10 x 3 = 30)**

1. Brugada syndrome.
2. Himalayan P-waves.
3. Mobitz Types I block.
4. Duke Tread mill score.
5. Epsilon waves.
6. RBBB.
7. DC version.
8. P-Mitrale.
9. ECG changes in pericarditis.
10. ECG features of TOF.

****

B.Sc. CARDIAC TECHNOLOGY
SECOND YEAR
PAPER II – ADVANCED ECG AND TREADMILL EXERCISE STRESS TESTING AND 24 HOUR AMBULATORY ECG AND BP RECORDING

Q.P. Code: 801532

Time: Three Hours   **Maximum: 100 Marks**

Answer all questions

I. Elaborate on: **(3 x 10 = 30)**

1. What are the physiological changes that take place during exercise test?
2. Electrocardiographic and non electrocardiographic, features used in exercise testing for diagnosis of coronary artery disease.
3. Discuss about the various types of Heart block.

II. Write notes on: **(8 x 5 = 40)**

1. What are the ECG features of right bundle branch block and left bundle branch block?
2. Which are the leads showing changes in RV Myocardial Infarction?
3. Differentiation of ventricular and supraventricular premature beats in ECG.
4. Different types of ST depression.
5. Reporting format of a treadmill test.
6. Anginal cascade and silent Myocardial Ischaemia.
7. ECG of hypokalaemia and hyperkalaemia.
8. Various types of holter monitoring and abnormalities in holter.

III. Short answers on: **(10 x 3 = 30)**

1. U wave in ECG.
2. Causes for right axis deviation.
3. Biatrial enlargement.
4. Indication for modified Bruce protocol.
5. Dietary advise before treadmill test.
6. Early post PCI treadmill. Does it indicate restenosis.
7. MASON LIKAR Modification of 12 lead ECG.
8. Relative contraindications in exercise stress test.
9. Effort tolerance in relation to METZ.
10. ECG features of hyperthyroidism.

****

B.Sc. CARDIAC TECHNOLOGY

SECOND YEAR

PAPER II – ADVANCED ECG AND TREADMILL EXERCISE STRESS TESTING AND 24 HOUR AMBULATORY ECG AND BP RECORDING

Q.P. Code: 801532

Time: Three Hours   **Maximum: 100 Marks**

Answer all questions

I. Elaborate on: **(3 x 10 = 30)**

1. Discuss the indications, contraindications and precautions while doing treadmill test.
2. What are the physiological changes takes place during exercise test?
3. Indications for 24 hours BP monitoring and its procedure.

II. Write notes on: **(8 x 5 = 40)**

1. P waves anomalies in ECG.
2. Discuss about monophasic and biphasic shock.
3. Absolute contraindications for exercise testing.
4. WPW syndrome.
5. Different scores used to risk stratify based on TMT.
6. Advantages and disadvantages of bicycle ergomister over treadmill.
7. Non electrocardiographic changes and importance.
8. Preparation and instruction to patient for a holter recording.

III. Short answers on: **(10 x 3 = 30)**

1. What ECG features will be seen in acute inferior wall MI and in which leads?
2. ECG features of hyperthyroidism.
3. ECG features of atrial flutter.
4. What are the ECG features of hypertrophic cardiomyopathy?
5. Indication for modified Bruce protocol.
6. Target heart rate for exercise test.
7. Bayers theorem.
8. Epsilon waves.
9. Indication for termination of exercise testing.
10. Usual BP response during exercise. What does accelerated response indicate?

****

[AHS 0321]   **MARCH 2021**   **Sub. Code: 1532**
(AUGUST 2020 EXAM SESSION)
B.Sc. CARDIAC TECHNOLOGY
SECOND YEAR (Regulation 2014-2015)
**PAPER II – ADVANCED ECG AND TREADMILL EXERCISE STRESS
TESTING AND 24 HOUR AMBULATORY ECG AND BP RECORDING**
Q.P. Code : 801532

Time: Three hours   Answer ALL Questions   Maximum: 100 Marks

I. Elaborate on: **(3 x 10 = 30)**

1. Discuss the ECG findings in ventricular tachycardia. How will you differentiate between ventricular tachycardia and supraventricular tachycardia?
2. Discuss the indications, contraindications and precautions while doing treadmill test.
3. Indications for holter, type of arrhythmia which can be detected by holter?

II. Write notes on: **(8 x 5 = 40)**

1. Post MI exercise testing indications and usefulness.
2. Types of Holter Monitoring.
3. Indications for 24 hours BP monitoring and its procedure.
4. Duke Tread mill score.
5. Different types of ST changes and it's their measurement.
6. Sensitivity and specificity of stress test.
7. Discuss about Mobitz type I and II block.
8. ECG features of hypo and hyperkalemia.

III. Short answers on: **(10 x 3 = 30)**

1. List out the causes of low voltage QRS complex.
2. Electrocardiographic features of Tetralogy of fallot.
3. Electrical alternans in electrocardiography.
4. P-pulmonale in electrocardiograph.
5. Usually BP response during exercise. What does accelerated response indicate?
6. Indication for termination of exercise testing.
7. METZ in stress test.
8. MASON LIKAR Modification of 12 lead ECG.
9. Digoxin toxicity.
10. Usefulness of holter in palpitation.

****

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0222] FEBRUARY 2022 Sub. Code: 1532
(AUGUST 2021 EXAM SESSION)

B.Sc. CARDIAC TECHNOLOGY
SECOND YEAR (Regulation 2014-2015)
PAPER II – ADVANCED ECG AND TREADMILL EXERCISE STRESS
TESTING AND 24 HOUR AMBULATORY ECG AND BP RECORDING
Q.P. Code : 801532

Time: Three hours Answer ALL Questions Maximum: 100 Marks

I. Elaborate on: (3 x 10 = 30)

1. Explain in detail about indication, contraindication and protocols of TMT.
2. Electrocardiographic and non electrocardiographic, features used in exercise testing for diagnosis of coronary artery disease.
3. Indications for Holter, type of arrhythmias which can be detected by Holter.

II. Write notes on: (8 x 5 = 40)

1. ECG Criteria for RVH.
2. Metabolic changes in ECG.
3. Which are the leads showing changes in RV myocardial Infarction?
4. Reporting format of a treadmill test.
5. 24 hours ambulatory BP monitoring.
6. Causes for T wave inversion in ECG.
7. Discuss about monophasic and biphasic shock.
8. Different scores used to risk stratify based on TMT.

III. Short answers on: (10 x 3 = 30)

1. LAHB and LPHB.
2. ECG features of mitral stenosis.
3. Causes for right axis deviation.
4. Dietary advice before treadmill test.
5. T-Waves in ECG.
6. Draw Einthoven triangle.
7. ECG features of Hyperthyroidism.
8. Indication for modified Bruce protocol.
9. Enumerate three points to diagnose a malignant VPC.
10. ECG features for Hyperkalemia.

****

[AHS 0922]   **SEPTEMBER 2022**   **Sub. Code: 1532**
(FEBRUARY 2022 & AUGUST 2022 EXAM SESSIONS)

B.Sc. CARDIAC TECHNOLOGY
SECOND YEAR (Regulation from 2014-2015)
PAPER II – ADVANCED ECG AND TREADMILL EXERCISE STRESS
TESTING AND 24 HOUR AMBULATORY ECG AND BP RECORDING
Q.P. Code : 801532

Time: Three hours   Answer ALL Questions   Maximum: 100 Marks

I. Elaborate on: **(3 x 10 = 30)**

1. Enumerate the various protocols for Treadmill Test. Discuss in detail about Bruce and Modified Bruce protocol.
2. Discuss the indications, contraindications and interpretation of 24 hours Holter monitoring.
3. Discuss in detail ECG features in various types of Myocardial Infarction.

II. Write notes on: **(8 x 5 = 40)**

1. ECG criteria in LVH.
2. Blood pressure changes during Treadmill exercise Test.
3. ECG features of Atrial abnormalities.
4. ECG in Left bundle branch block.
5. Causes for left axis deviation.
6. Atrial flutter versus Atrial fibrillation.
7. Augmented Leads and Einthoven Triangle.
8. Wolf Parkinson White syndrome (WPW Syndrome).

III. Short answers on: **(10 x 3 = 30)**

1. Indications of Cardioversion.
2. Sine wave pattern.
3. Ventricular Trigeminy.
4. "U" Wave.
5. Horizontal ST depression in Treadmill Test.
6. First degree Atrio ventricular block.
7. How will you give DC shock?
8. ECG in Pericarditis.
9. Q-T interval.
10. Biploar Lead.

****

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0423]   APRIL 2023   Sub. Code: 1532

B.Sc. CARDIAC TECHNOLOGY
SECOND YEAR (Regulations 2014-2015, 2018-2019 & 2020-2021 onwards)
PAPER II – ADVANCED ECG AND TREADMILL EXERCISE STRESS
TESTING AND 24 HOUR AMBULATORY ECG AND BP RECORDING
Q.P. Code: 801532

Time: Three hours   Answer ALL Questions   Maximum: 100 Marks

I. Elaborate on: (3 x 10 = 30)

1. Discuss various Types of Atrioventricular Blocks (AV Block).
2. Ventricular Arrhythmias – Mechanism and ECG features of Ventricular Tachycardia and Ventricular Fibrillation.
3. Discuss the Patient Preparation and Instructions, Lead systems and Electrocardiographic changes during Treadmill Test.

II. Write notes on: (8 x 5 = 40)

1. Left Atrial Enlargement.
2. Tread Mill Dukes score.
3. Torsades de Pointes.
4. Indications for 24 hour Holter monitoring.
5. Repolarisation abnormalities in ECG.
6. DC shock.
7. ECG findings in Left Bundle Branch Block.
8. Advantages and disadvantages of Treadmill Test.

III. Short answers on: (10 x 3 = 30)

1. Accelerated Idioventricular Rhythm.
2. Right Ventricular Hypertrophy.
3. Posterior Wall Myocardial Infarction.
4. Draw Normal ECG. Explain the Waves and Intervals.
5. Ventricular couplets.
6. Upslope ST depression in Treadmill Test.
7. Right Atrial enlargement.
8. Non sustained Ventricular Tachycardia.
9. Modified Bruce Protocol.
10. Metabolic Equivalents.

****

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 1123] NOVEMBER 2023 Sub. Code: 1532

B.Sc. CARDIAC TECHNOLOGY
SECOND YEAR (Regulations 2014-2015, 2018-2019 & 2020-2021 onwards)
PAPER II – ADVANCED ECG AND TREADMILL EXERCISE STRESS
TESTING AND 24 HOUR AMBULATORY ECG AND BP RECORDING
Q.P. Code: 801532

Time: Three hours Answer ALL Questions Maximum: 100 Marks

I. Elaborate on: (3 x 10 = 30)

1. Explain in detail about Indications, Contraindications and Protocols of TMT.
2. Draw the Conduction system and explain in detail about various types of Heart Block.
3. Draw a normal ECG and explain changes in Acute MI, how do you identify the Coronary Artery Involvement?

II. Write notes on: (8 x 5 = 40)

1. 24 hours Ambulatory BP monitoring.
2. Ventricular Arrhythmias.
3. P waves anomalies in ECG.
4. Causes for 'T' wave inversion in ECG.
5. Modified Bruce protocol.
6. Einthoven triangle.
7. Sensitivity and specificity of stress test.
8. ECG changes in pericarditis.

III. Short answers on: (10 x 3 = 30)

1. Brugada Syndrome.
2. Himalayan P-waves.
3. Long QT Syndrome.
4. U wave in ECG.
5. Atrial flutter.
6. DC shock.
7. Enumerate three points to diagnose RVH.
8. Enumerate three points to diagnose a Malignant VPC.
9. Modified Chest leads.
10. Normal segments and intervals in ECG.

****