

[LJ 0816]

AUGUST 2016

Sub. Code: 1533

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

SECOND YEAR

Paper III – ECHOCARDIOGRAPHY

Q.P. Code : 801533

Time: Three Hours

Maximum: 100 Marks

Answer all questions

I. Elaborate on:

(3 x 10 = 30)

1. Echocardiographic evaluation of Left Ventricular diastolic dysfunction.
2. Assessment of stroke volume and cardiac output in Echo.
3. Uses of echocardiogram in the differential diagnosis of chest pain.

II. Write Notes on:

(8 x 5 = 40)

1. M-Mode Echocardiography.
2. Determination of situs by echocardiogram.
3. Left atrial thrombus.
4. Mitral valve prolapse.
5. Pericardial Effusion.
6. Echo features of Coarctation of Aorta.
7. Views in transthoracic Echocardiography.
8. Atrial septal defect.

III. Short Notes on:

(10 x 3 = 30)

1. Doppler Shift.
2. Restrictive Cardiomyopathy.
3. Pulmonary systemic flow ratio (Qp/Qs).
4. Assessment of pulmonary arterial hypertension in Echo.
5. Left atrium volume and its usefulness.
6. Principles of Doppler effect.
7. Trans valvular Gradient.
8. Patent ductus arteriosus.
9. Calculation of valve area in prosthetic valve.
10. Mitral regurgitation.

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

SECOND YEAR

Paper III – ECHOCARDIOGRAPHY

Q.P. Code : 801533

Time: Three Hours

Maximum: 100 Marks

Answer all questions

I. Elaborate on:

(3 x 10 = 30)

1. Describe the echocardiographic features of different cardiomyopathies.
2. Echocardiographic assessment of hemodynamic parameters.
3. Describe the Echocardiographic detection of acyanotic congenital heart diseases.

II. Write Notes on:

(8 x 5 = 40)

1. Doppler Echocardiography.
2. Differential diagnosis of Echogenic mass in the left atrium.
3. Patent ductus arteriosus.
4. Pulmonary stenosis.
5. Continuity equation.
6. Illustrate the structure in apical 2 – chamber view.
7. Transvalvular Gradient.
8. Views in transthoracic Echocardiography.

III. Short Notes on:

(10 x 3 = 30)

1. Myocardial performance index.
2. Echocardiographic assessment of suitability of mitral valve valvuloplasty.
3. Vegetation versus thrombus in Echo.
4. Myocardial sparkle.
5. Uses of Echo.
6. Transducers.
7. Echo features of constrictive Pericarditis.
8. Sub coastal view.
9. Aortic regurgitation.
10. Flail mitral valve.

B.Sc. CARDIAC TECHNOLOGY
SECOND YEAR
PAPER III – ECHOCARDIOGRAPHY
Q.P. Code: 801533

Time: Three Hours**Maximum : 100 Marks****Answer All questions****I. Elaborate on:****(3 x 10 =30)**

1. Describe with neat labelled diagram the 17 segment model of left ventricle for regional wall motion assessment, also mention the wall motion score index.
2. Elaborate on echo evaluation of mitral regurgitation (mild, moderate and severe) with diagrams and various echo parameters used to assess mitral regurgitation.
3. Elaborate on echo features of dilated cardiomyopathy and hypertrophic cardiomyopathy.

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

1. Mention the indications of bubble contrast echo. Write in short about the technique of bubble contrast echo.
2. Mention point wise echo features of cardiac tamponade.
3. Write echo features of Tetralogy of Fallot.
4. Write a note with formula on how to calculate pulmonary artery pressure on echo study?
5. Write indications and contraindications of transesophageal echo (TEE).
6. Draw neat labelled diagram of parasternal long axis (PLAX) and parasternal short axis (PSAX) views in 2D echo study.
7. Write Stages of LV diastolic dysfunction based on echo indices in a tabular manner.
8. Draw neat labelled diagram of left to right shunts (ASD, VSD, PDA) seen in various echo views (A4C, PSAX, SUBCOSTALS).

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

1. Mention various modes used in an echo study.
2. Write three points comparing Pulse wave Doppler and Continuous wave Doppler.
3. Mention echo features of coarctation of aorta. What is the commonest site of coarctation?
4. Classify aortic stenosis based on echo gradients (peak and mean).
5. Write the differential diagnosis of right atrium mass.
6. Write echo features of rheumatic mitral valve.
7. Write types of aortic dissection with diagrams.
8. Write the principles of colour Doppler.
9. Draw a neat labelled diagram of suprasternal long axis view. What is it commonly used to diagnose?
10. Write in short about tissue doppler imaging (TDI).

B.Sc. CARDIAC TECHNOLOGY
SECOND YEAR
PAPER III – ECHOCARDIOGRAPHY

Q.P. Code: 801533

Time: Three Hours

Maximum : 100 Marks

Answer All questions

I. Elaborate on:

(3 x 10 =30)

1. Describe with diagrams the 17 segment model of left ventricle for regional wall motion abnormality.
2. Echo features of constrictive Vs restrictive cardiomyopathy.
3. Segmental echocardiographic approach to congenital heart disease.

II. Write notes on:

(8 x 5 = 40)

1. Illustrate the structures visualised in suprasternal view.
2. PISA.
3. Techniques and usefulness of contrast echocardiogram.
4. Various methods to assess left ventricular systolic function.
5. Calculation of QP and QS in congenital heart disease.
6. Assessment of pulmonary arterial hypertension in ECHO.
7. Wilkinson's score of mitral valve.
8. Echocardiographic features of Ebstein's anomaly.

III. Short answers on:

(10 x 3 = 30)

1. Doppler shift.
2. Comparison between pulse wave and continuous wave doppler.
3. Echocardiatic assessment of stroke volume.
4. Continuity equation.
5. DP / DT.
6. De-Bakey classification of aortic dissection.
7. Illustrate the structures visualised in parasternal short axis view at aortic level.
8. Echo features of coarctation of aorta.
9. Echo cardiographic features of left atrial myxoma.
10. Contraindications for transoesophageal echocardiogram.

B.Sc. CARDIAC TECHNOLOGY
SECOND YEAR
PAPER III – ECHOCARDIOGRAPHY

Q.P. Code: 801533

Time: Three Hours

Maximum : 100 Marks

Answer All questions

I. Elaborate on:

(3 x 10 =30)

1. Echocardiographic evaluation of left ventricular diastolic dysfunction.
2. Define cardiomyopathy with type of cardiomyopathy and its echo features.
3. Echocardiography features of constrictive pericarditis Vs restrictive cardiomyopathy.

II. Write notes on:

(8 x 5 = 40)

1. Coarctation of aorta.
2. Draw a neat diagram of parasternal long axis and short axis view.
3. Simson method in assessment of left ventricular function.
4. Assessment of pulmonary arterial hypertension by echo.
5. Left atrial volume.
6. Cardiac tamponade.
7. Echo cardiographic methods to assess severity of mitral stenosis.
8. Criteria to diagnosis severity of aortic regurgitation.

III. Short answers on:

(10 x 3 = 30)

1. Assessment of severity of aortic stenosis.
2. Types of atrial septal defect.
3. Define patent ductus arteriosus with a neat diagram.
4. Myocardial performance index.
5. Pressure half time.
6. LA Myxoma.
7. IVRT.
8. Principles of doppler shift.
9. Write in short about tissue doppler imaging (TDI).
10. Four cardinal features of tetralogy of fallot.

**B.Sc. CARDIAC TECHNOLOGY
SECOND YEAR
PAPER III – ECHOCARDIOGRAPHY**

Q.P. Code: 801533

Time: Three Hours

Maximum: 100 Marks

Answer all questions

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

1. Describe the technique of transoesophageal echocardiogram with illustrations of structures visualized at different levels.
2. Echocardiographic assessment of hemodynamic parameters.
3. Describe with neat labeled diagram the 17 segment model of left ventricle for regional wall motion assessment, also mention the wall motion score index.

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

1. Principles of doppler.
2. LA volume and its usefulness.
3. Views in transthoracic Echocardiography.
4. Echocardiographic assessment of suitability of mitral valve for balloon valvuloplasty.
5. Sinus of valsalva rupture – echo features.
6. Write a note with formula on how to calculate pulmonary artery pressure on echo study.
7. Write in short about Tissue Doppler Imaging (TDI).
8. Types of atrial septal defect.

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

1. Myocardial speckle.
2. Pulse Doppler study of pulmonary venous flow.
3. Mitral valve prolapse.
4. Pericardial effusion.
5. Structures seen in long axis parasternal view.
6. Types of Stress Echocardiography.
7. Echocardiographic findings in corrected transposition.
8. Calculation of valve area in prosthetic valve.
9. Echocardiographic differentiation of true ventricular aneurysm from Pseudoaneurysm.
10. Echo features of hypertrophic obstructive cardiomyopathy.

**B.Sc. CARDIAC TECHNOLOGY
SECOND YEAR
PAPER III – ECHOCARDIOGRAPHY**

Q.P. Code: 801533

Time: Three Hours

Maximum: 100 Marks

Answer all questions

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

1. Assessment and Grading of Diastolic dysfunction with diastolic filling pattern in Atrial Fibrillation and Sinus Tachycardia.
2. Segmental echocardiographic approach to congenital heart disease.
3. Describe with neat labeled diagram the 17 segment model of left ventricle for regional wall motion assessment, also mention the wall motion score index.

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

1. Merits and limitation of M mode echocardiogram.
2. Colour flow Doppler imaging – technique, utility and limitations.
3. Different methods of calculation of ejection fraction by Echo and their limitations.
4. Write echo features of rheumatic mitral valve.
5. Echocardiographic signs of cardiac tamponade.
6. Assessment of severity of aortic stenosis, usefulness and limitation of continuity equation.
7. Echocardiographic features of Tetralogy of Fallot.
8. Calculation of left ventricular Mass.

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

1. Doppler shift.
2. Vegetation Vs thrombus in Echocardiogram.
3. Determination of mitral valve area by pressure half time.
4. Usefulness of colour B mode scanning.
5. Draw and label the LV Myocardial segments.
6. DP/DT.
7. Techniques and usefulness of contrast echocardiogram.
8. Echocardiographic assessment of stroke volume.
9. Flail mitral valve.
10. Illustrate the structures visualized in suprasternal view.

B.Sc. CARDIAC TECHNOLOGY
SECOND YEAR
PAPER III – ECHOCARDIOGRAPHY

Q.P. Code: 801533

Time: Three Hours

Maximum: 100 Marks

Answer all questions

I. Elaborate on:

(3 x 10 = 30)

1. Doppler principle – Discuss the difference between pulsewave doppler and continuous wave doppler.
2. Discuss the echocardiographic features of severe mitral stenosis.
3. Contrast Echo- Indications, procedure and interpretation.

II. Write notes on:

(8 x 5 = 40)

1. Assessment of pulmonary artery hypertension.
2. Left atrial myxoma.
3. Assessment of pericardial effusion.
4. Features of pulmonary thrombo-embolism.
5. Wall motion score index.
6. Left ventricular thrombus versus artifact.
7. 2D and transesophageal echo features of atrial septal defect.
8. Criteria to diagnosis severity of aortic regurgitation.

III. Short answers on:

(10 x 3 = 30)

1. Mitral valve prolapse.
2. Vegetation.
3. Coarctation of aorta.
4. Teicholtz method.
5. Grade – II LV diastolic dysfunction.
6. Moderator band.
7. Pressure half time.
8. Bicuspid aortic valve.
9. 5 chamber view.
10. Patent foramen ovale.

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

[AHS 0321]

MARCH 2021

Sub. Code: 1533

**(AUGUST 2020 EXAM SESSION)
B.Sc. CARDIAC TECHNOLOGY
SECOND YEAR (Regulation 2014-2015)
PAPER III – ECHOCARDIOGRAPHY
Q.P. Code : 801533**

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(3 x 10 = 30)

1. Discuss Various Methods to assess Aortic Regurgitation and Aortic Stenosis.
2. Echo Features of Dilated & Hypertrophic Cardiomyopathies.
3. What are the types of Ventricular septal defect, discuss the echo features of each type.

II. Write notes on:

(8 x 5 = 40)

1. Echo features of Pulmonary Thrombo-embolism.
2. Types of Atrial septal defect and its Echo features.
3. Draw the diagram of M-mode at the tip of Mitral leaflet.
4. Wilkin's Score Index.
5. Various Methods to calculate Pulmonary Artery Hypertension.
6. Non-Ischemic causes for Regional wall motion Abnormality.
7. Indications for Transesophageal Echocardiography.
8. Left Ventricular Thrombus versus Artefact.

III. Short answers on:

(10 x 3 = 30)

1. Eccentric Mitral Regurgitation.
2. Suprasternal View.
3. Pressure half time.
4. Continuity equation for Mitral valve.
5. Grading of Aortic Regurgitation.
6. Echo features of normal right ventricle.
7. Types of Atrial septal defect.
8. Pulmonary Regurgitation.
9. Diagram – Short axis view at Aortic valve level.
10. TAPSE (Tricuspid Annular Plane Systolic Excursion).

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

[AHS 0222]

**FEBRUARY 2022
(AUGUST 2021 EXAM SESSION)**

Sub. Code: 1533

**B.Sc. CARDIAC TECHNOLOGY
SECOND YEAR (Regulation 2014-2015)
PAPER III – ECHOCARDIOGRAPHY
*Q.P. Code : 801533***

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(3 x 10 = 30)

1. Transesophageal Echo – Indications, Contra-indications And Views.
2. Dobutamine Stress Echo – Indications, Contra-indications and Protocol.
3. Restrictive Cardiomyopathy versus Constrictive pericarditis.

II. Write notes on:

(8 x 5 = 40)

1. Pulse wave Doppler versus Continuous wave Doppler.
2. Features of Cardiac Tamponade.
3. Segmental approach of Congenital Heart Disease.
4. Assessment of Aortic Regurgitation.
5. Methods to calculate Mitral Valve Stenosis.
6. Assessment of Prosthetic Valve Dysfunction.
7. Calculation of Ejection Fraction – Methods and Grading.
8. Segments of left Ventricle.

III. Short answers on:

(10 x 3 = 30)

1. LV clot.
2. Pericardial Effusion.
3. Patent Ductus Arteriosus.
4. Akinesia and Dyskinesia.
5. Flail Mitral Valve.
6. Grade III & IV LV Diastolic Dysfunction.
7. LA Thrombus.
8. Sub-coastal view.
9. Contrast Agents.
10. Bicaval view.

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

[AHS 0922]

SEPTEMBER 2022

Sub. Code: 1533

(FEBRUARY 2022 & AUGUST 2022 EXAM SESSIONS)

**B.Sc. CARDIAC TECHNOLOGY
SECOND YEAR (Regulation from 2014-2015)
PAPER III – ECHOCARDIOGRAPHY
*Q.P. Code : 801533***

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(3 x 10 = 30)

1. Draw all the trans thoracic echo views and explain.
2. Discuss the procedure, indications, contraindications and views of trans oesophageal echocardiography.
3. Explain in detail about Hypertrophic Cardiomyopathy.

II. Write notes on:

(8 x 5 = 40)

1. Estimation of Cardiac output and Stroke volume by Echo.
2. What is M-mode? Draw and mention the measurement of cardiac dimensions taken using M-mode.
3. Echocardiography features in Tetralogy of Fallot.
4. Explain Continuity Equation.
5. Difference between pulse wave and continuous wave Doppler.
6. LA volume and its usefulness.
7. 2-D and Doppler assessment of prosthetic valves.
8. Echocardiographic assessment of aortic stenosis.

III. Short answers on:

(10 x 3 = 30)

1. Echo features of Coarctation of aorta.
2. What is the normal mitral and aortic valve area?
3. Mention the Doppler features for restrictive diastolic filling pattern.
4. Define Pressure half time.
5. Define Deceleration time.
6. Types of Atrial Septal Defect.
7. Echo findings of Pulmonary embolism.
8. Assessment of pulmonary arterial hypertension in Echo.
9. Myocardial performance index.
10. 2D features of Mitral Stenosis.

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

[AHS 0423]

APRIL 2023

Sub. Code: 1533

B.Sc. CARDIAC TECHNOLOGY
SECOND YEAR (Regulations 2014-2015, 2018-2019 & 2020-2021 onwards)
PAPER III – ECHOCARDIOGRAPHY
Q.P. Code : 801533

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(3 x 10 = 30)

1. Discuss Echo criteria to diagnose severity of Mitral Regurgitation. Explain Proximal Isovelocity surface area method for estimating Mitral Regurgitation.
2. Echocardiography features of Constrictive Pericarditis Vs Restrictive Cardiomyopathy.
3. Explain in detail about Dilated Cardiomyopathy.

II. Write notes on:

(8 x 5 = 40)

1. Echo assessment of Atrial Septal Defect.
2. Echo features of LA Myxoma.
3. Echo assessment of Ventricular Septal Defect.
4. Assessment of Mitral Valve Prolapse in Echo.
5. Different methods for calculating Ejection Fraction in Echo.
6. Indications and contraindications of Transoesophageal Echo.
7. Mention the indications of Bubble Contrast Echo. Write in short about the technique of Bubble Contrast Echo.
8. Transvalvular Gradient.

III. Short answers on:

(10 x 3 = 30)

1. Bernoulli's Equation.
2. Echo features of Tetralogy of Fallot.
3. Features of Pulmonary Thrombo-Embolism.
4. Grading of Mitral Stenosis using mean gradient.
5. Pulmonary Artery acceleration time.
6. Difference between LV thrombus and artifact.
7. Draw and explain Parasternal short axis at aortic level.
8. What is B-Mode?
9. Estimation of AVA by continuity equation.
10. Complications of Infective Endocarditis.

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

[AHS 1123]

NOVEMBER 2023

Sub. Code: 1533

B.Sc. CARDIAC TECHNOLOGY
SECOND YEAR (Regulations 2014-2015, 2018-2019 & 2020-2021 onwards)
PAPER III – ECHOCARDIOGRAPHY
Q.P. Code: 801533

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

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

1. Discuss the Segmental Echocardiographic approach to Congenital Heart disease.
2. Define Cardiomyopathy. Discuss the various types of Cardiomyopathy and its Echocardiographic features.
3. Describe the technique of Transoesophageal Echocardiogram with illustrations of structures visualized at a different levels.

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

1. Principles of Doppler.
2. Formula used to calculate Pulmonary Artery Pressure in Echo Study.
3. Stress Echocardiography.
4. Wilkinson's score of Mitral valve.
5. Prosthetic valve assessment.
6. Mention point wise echo features of Cardiac Tamponade.
7. Continuity equation.
8. Illustrate the structure in Apical 2 – Chamber view.

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

1. Tissue Doppler Imaging (TDI).
2. Ejection fraction and its uses.
3. Write three points comparing Pulse Wave Doppler and Continuous Wave Doppler.
4. Echo Cardiographic features of Left Atrial Myxoma.
5. Assessment of Severity of Aortic stenosis.
6. Uses of ECHO in assessment of chamber enlargement.
7. Uses of contrast echocardiography.
8. IVRT.
9. ECHO features of Pericardial effusion.
10. Myocardial speckle.
