

August 2009

[KV 005]

Sub. Code: 1151

D.M. DEGREE EXAMINATION

(Higher Specialities)

Branch II - Cardiology

(Revised Regulations)

Paper I – BASIC SCIENCES - CARDIOLOGY

Q.P. Code: 161151

Time: Three hours

Maximum: 100 Marks

Answer ALL questions

Draw suitable diagrams wherever necessary.

I. Essays:

2 x 20 = 40

1. Discuss “Foetal Circulation”.
2. Discuss “Cono – Truncal anomalies”.

II. Write short notes on:

10 x 6 = 60

1. Third heart sound (S3).
2. Fick's principles.
3. Lipoprotein – A (LP (a)).
4. Pulmonary vascular resistance (PVR).
5. Anti-factor Xa compounds.
6. Ivabradine.
7. Pulsus paradoxus.
8. Q-T interval on ECG.
9. Hypercalcemia.
10. Right ventricle.

August 2011

[KZ 005]

Sub. Code: 1421

**DOCTORATE OF MEDICINE (D.M.) DEGREE EXAMINATION
(SUPER SPECIALITIES)**

BRANCH II – CARDIOLOGY

BASIC SCIENCES

Q.P. Code: 161421

**Time : 3 hours
(180 Min)**

Maximum : 100 marks

Answer ALL questions in the same order.

I. Elaborate on :

	Pages (Max.)	Time (Max.)	Marks (Max.)
1. Discuss the Cardiac Ion Channels and their role in arrhythmogenesis.	11	35	15
2. Discuss the pharmacotherapy of Congestive Cardiac failure.	11	35	15

II. Write notes on :

1. Development of Cardiac conduction system.	4	10	7
2. Pharmacological intervention for the prevention of left ventricular remodeling and improving prognosis in myocardial infarction.	4	10	7
3. Congenital Coronary Artery Anomalies.	4	10	7
4. Medical management of Marfan's syndrome.	4	10	7
5. Aortitis.	4	10	7
6. Pathophysiology of Chronic Cor Pulmonale.	4	10	7
7. Cellular mechanism of action of Thyroid hormone on Cardiac myocyte.	4	10	7
8. Takotsubo Cardiomyopathy.	4	10	7
9. Alcohol and Total cardiovascular mortality.	4	10	7
10. Clinical morphology of the RV outflow tract.	4	10	7

February 2012

[LA 005]

Sub. Code: 1421

DOCTORATE OF MEDICINE (D.M.) DEGREE EXAMINATION

(SUPER SPECIALITIES)

BRANCH II – CARDIOLOGY

BASIC SCIENCES

Q.P. Code: 161421

**Time : 3 hours
(180 Min)**

Maximum : 100 marks

Answer ALL questions in the same order.

I. Elaborate on :

Pages (Max.)	Time (Max.)	Marks (Max.)
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- | | | | |
|--|----|----|----|
| 1. Anatomy and Physiology of normal coronary artery circulation in health and disease. | 16 | 35 | 15 |
| 2. Pathophysiology of acute aortic regurgitation. | 16 | 35 | 15 |

II. Write notes on:

- | | | | |
|-----------------------------------|---|----|---|
| 1. Prolonged QT syndrome. | 4 | 10 | 7 |
| 2. Electrical storm. | 4 | 10 | 7 |
| 3. Mitral valve anatomy. | 4 | 10 | 7 |
| 4. Scimitar syndrome. | 4 | 10 | 7 |
| 5. Pseudohypertension. | 4 | 10 | 7 |
| 6. Low molecular weight heparins. | 4 | 10 | 7 |
| 7. Genetics of TOF. | 4 | 10 | 7 |
| 8. Cardiac involvement in HIV. | 4 | 10 | 7 |
| 9. Afterload mismatch. | 4 | 10 | 7 |
| 10. Asplenia syndrome. | 4 | 10 | 7 |

[LB 005]

AUGUST 2012
D.M – CARDIOLOGY
Paper – I BASIC SCIENCES
Q.P. Code: 161421

Sub. Code: 1421

Time: 3 hours
(180 Min)

Maximum: 100 marks

Answer ALL questions in the same order.

I. Elaborate on:

	Pages (Max.)	Time (Max.)	Marks (Max.)
1. Discuss lipid metabolism, dyslipidemia and its therapy.	16	35	15
2. Discuss in detail diagnostic workup of pulmonary hypertension and its pharmacologic management.	16	35	15

II. Write notes on:

1. Discuss lipoprotein A and its pathophysiologic significance.	4	10	7
2. Describe the coronary artery and its significance in relation to interventional management.	4	10	7
3. After depolarization and arrhythmias induced by after depolarization-write an account.	4	10	7
4. Describe the pathology of Aschoff nodules.	4	10	7
5. Describe Bayes theorem and its clinical applications.	4	10	7
6. Discuss the diagnosis and clinical relevance of atrial septal aneurysm.	4	10	7
7. Describe the chest radiograph findings in coarctation of aorta.	4	10	7
8. What is Laplace law? Describe its clinical application.	4	10	7
9. Give a brief account on left ventricular reverse remodeling.	4	10	7
10. Describe the fetal circulatory changes at birth.	4	10	7

(LD 005)

AUGUST 2013

Sub. Code:1421

D.M. – CARDIOLOGY
Paper – I BASIC SCIENCES
Q.P.Code: 161421

Time: Three Hours

Maximum: 100 marks

I. Elaborate on:

(2X15=30)

1. Role of endothelial cell in vascular biology in normal and in diseased states.
2. Current clinical classification of pulmonary hypertension and discuss in detail about pulmonary hypertension secondary to left heart failure.

II. Write notes on:

(10X7=70)

1. Physiology of excitation contraction coupling and alterations in heart failure.
2. Anatomy of atrioventricular node.
3. Endothelial progenitors cells in cell regenerative therapy.
4. Gene mutations causing arrhythmogenic right ventricular dysplasia.
5. Measurement of advantages and limitations of coronary flow reserve.
6. Newer risk factors for coronary artery disease.
7. Left ventricular remodeling after acute myocardial infarction.
8. Functions of left atrium and dysfunction in heart failure.
9. Arrhythmias caused by delayed after depolarization and their clinical presentation and therapy.
10. Strategy for primary prevention of coronary heart disease.

(LH 005)

AUGUST 2015

Sub. Code:1421

D.M. – CARDIOLOGY
Paper I – BASIC SCIENCES
Q.P.Code: 161421

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 15 = 30)

1. JVP in Health and Disease.
2. Discuss the anatomy of the mitral apparatus and write on congenital Mitral Valve Abnormalities.

II. Write notes on:

(10 x 7 = 70)

1. Orthostatic hypotension.
2. Echocardiographic assessment of aortic stenosis with LV dysfunction.
3. Dynamic auscultation.
4. Mechanism of Tachyarrhythmias.
5. Radiation protection for interventionists.
6. HDL cholesterol.
7. Myocardial Preconditioning.
8. Differential Cyanosis.
9. Vulnerable plaque.
10. Head - Up Tilt test.

(LJ 005)

AUGUST 2016

Sub. Code:1421

D.M. – CARDIOLOGY
Paper I – BASIC SCIENCES
Q.P.Code: 161421

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 15 = 30)

1. Cardiac Biomarkers.
2. Exercise Electro Cardiographic Testing. Evaluation of myocardial viability.

II. Write notes on:

(10 x 7 = 70)

1. End of Life indication in permanent pacemaker.
2. Sensitivity and specificity of a diagnostic test.
3. Pharmacogenetics.
4. AV Node.
5. Action Potential of myocardial cell.
6. Doppler Principle.
7. Echocardiographic evaluation of RV function.
8. Myocardial perfusion contrast enhanced echocardiography.
9. Stress Echocardiography.
10. Pulmonary hangout interval.

(LK 005)

FEBRUARY 2017

Sub. Code:1421

D.M. – CARDIOLOGY

Paper I – BASIC SCIENCES

Q.P.Code: 161421

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 15 = 30)

1. Single Photon Emission computed Tomography Imaging in cardiology.
2. Magnetic Resonance Imaging in Cardiology.

II. Write notes on:

(10 x 7 = 70)

1. Molecular Imaging of the Cardio Vascular system.
2. Coronary Artery Calcium scanning.
3. Nitric Oxide.
4. Reverse Remodeling.
5. QT Dispersion.
6. Wenckebach Block.
7. Event Recording.
8. Triggered Activity.
9. Entrainment.
10. Ambulatory BP Monitoring.

(LL 005)

AUGUST 2017

Sub. Code:1421

D.M. – CARDIOLOGY

Paper I – BASIC SCIENCES

Q.P.Code: 161421

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 15 = 30)

1. Describe the embryological development of the Endocardial cushion and spectrum of Endocardial cushion defects.
2. Discuss the pathology, clinical manifestations and diagnostic criteria for Infective Endocarditis with a special note on culture negative Endocarditis.

II. Write notes on:

(10 x 7 = 70)

1. Newer cardiac biomarkers.
2. Osborne Wave.
3. Myocardial ischaemic preconditioning.
4. Action potential of myocardial cell and cardiac pacemaker cell.
5. Clopidogrel Resistance.
6. False positive Treadmill Test.
7. Assessment of RV Function (Right ventricular).
8. Genetics of HCM (Hypertrophic cardio myopathy).
9. Vascular slings and rings.
10. Embryology of IVC.

(LN 005)

AUGUST 2018

Sub. Code: 1421

D.M. – CARDIOLOGY

Paper I – BASIC SCIENCES

Q.P.Code: 161421

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 15 = 30)

1. Developmental embryology and fate of the aortic arches in the fetus adding a special note on the various anomalies.
2. Describe the anatomy of the mitral valve apparatus and write on the pathophysiology of chronic rheumatic mitral regurgitation versus acute mitral regurgitation.

II. Write notes on:

(10 x 7 = 70)

1. Second degree atrio-ventricular block.
2. Hang out interval.
3. Venous drainage of the heart.
4. Myocardial Bridging.
5. Coagulation cascade.
6. Ranolazine.
7. 'A' wave in the Jugular venous tracing.
8. Oxymetry for the detection of intra cardiac shunts.
9. Frank Starlings law of the heart.
10. Atrial Isomerism.

(LO 005)

FEBRUARY 2019

Sub. Code: 1421

D.M. – CARDIOLOGY

Paper I – BASIC SCIENCES

Q.P. Code: 161421

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 15 = 30)

1. Discuss the embryology and anatomy of the interatrial septum. Discuss the echocardiographic evaluation the of Inter Atrial septum with special relevance to device closure.
2. Describe the ultrastructure of myocyte and the mechanics of myocardial contraction.

II. Write notes on:

(10 x 7 = 70)

1. Reverse Cholesterol Transport.
2. Genetics in Arrhythmogenic Right ventricular cardiomyopathy.
3. High altitude cardiovascular adaptation.
4. Ryanodine receptors.
5. Pathophysiology of ventricular hypertrophy.
6. P Value and Odds ratio.
7. Scimitar syndrome.
8. Dual AV nodal physiology.
9. Venturi effect and its role in cardiology.
10. Electrophysiology of Atrial Flutter.

(LP 005)

AUGUST 2019

Sub. Code: 1421

D.M. – CARDIOLOGY

Paper I – BASIC SCIENCES

Q.P. Code: 161421

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 15 = 30)

1. Discuss the molecular basis of cardiac action potential. Discuss the etiopathogenesis of channelopathies.
2. Discuss the role of endothelium and blood in the coagulation cascade and its therapeutic implications in pharmacotherapy.

II. Write notes on:

(10 x 7 = 70)

1. Genetic basis of Brugada syndrome.
2. Fick's Principle.
3. Reverse wenckebach phenomenon.
4. Electrical Storm.
5. Obligatory Shunt.
6. Baye's theorem and its application.
7. Ventricular interdependence.
8. Matrix Mineraloproteinase.
9. Lewis cycle.
10. Surface anatomy of subclavian venous system.

(LQ 005)

FEBRUARY 2020

Sub. Code: 1421

D.M. – CARDIOLOGY

Paper I – BASIC SCIENCES

Q.P. Code: 161421

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 15 = 30)

1. The development of the inter atrial septum, classify and describe the pathophysiology of various types of atrial septal defects.
2. The neuro humoral mechanisms operating in cardiac failure.

II. Write notes on:

(10 x 7 = 70)

1. Cardiac conduction system and blood supply.
2. Culture negative endocarditis.
3. Kochs triangle.
4. Pulmonary Vascular Resistance (PVR).
5. Pathology of vulnerable plaque.
6. Ticagrelor.
7. Aortitis.
8. Electrocardiographic (ECG) criteria of right ventricular hypertrophy.
9. Hypocalcaemia.
10. Anatomy of the Left ventricle.

(LR 005)

**NOVEMBER 2020
(AUGUST 2020 SESSION)**

Sub. Code: 1421

D.M. – CARDIOLOGY

Paper I – BASIC SCIENCES

Q.P. Code: 161421

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 15 = 30)

1. Discuss the anatomy of right atrium & left atrium with reference to electrophysiology studies (EPS) and radiofrequency catheter ablation,
2. Discuss in detail the blood supply of the heart & collaterals.

II. Write notes on:

(10 x 7 = 70)

1. Brain natriuretic peptide.
2. Endothelin.
3. Reperfusion injury.
4. Fetal circulation.
5. Vulnerable plaque.
6. Pathogenesis of in stent restenosis.
7. Flamm formula.
8. Genetic basis of long QT syndrome.
9. Culture negative endocarditis
10. Hypokalemia

(DM 0221)

FEBRUARY 2021

Sub. Code: 1421

D.M. – CARDIOLOGY

Paper I – BASIC SCIENCES

Q.P. Code: 161421

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 15 = 30)

1. Discuss the pathophysiological changes in cardiovascular system in Covid-19 infection and its management.
2. Discuss in detail about aetiology and pathophysiology of Coronary Artery Aneurysms and its management.

II. Write notes on:

(10 x 7 = 70)

1. Cardiac Apoptosis.
2. Morphology of RVOT. (Right Ventricular Outflow Tract.).
3. Congenital Coronary Artery Anomalies.
4. Takosubo Cardiomyopathy.
5. Development of Interatrial Septum.
6. Apoproteins.
7. Hibernating Myocardium.
8. Coronary Flow Reserve.
9. QT Dispersion.
10. Myocardial Bridging.

(DM 0821)

AUGUST 2021

Sub. Code: 1421

D.M. – CARDIOLOGY

Paper I – BASIC SCIENCES

Q.P. Code: 161421

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 15 = 30)

1. Discuss cardiac cycle and the role of pressure–volume loops and parameters in relation to cardiac function.
2. Discuss the dynamics of pulmonary circulation and its modifications with cardiac diseases.

II. Write notes on:

(10 x 7 = 70)

1. Autonomous nervous system of the heart.
2. Calculation of flow in bidirectional shunts.
3. Membrane stabilization property.
4. Role of molecular biology in cardiology.
5. Micro RNA's in cardiac hypertrophy and failure.
6. Ventricular wall stress.
7. SA Node peculiar features.
8. Hyperkalemia.
9. Apoptosis.
10. Pathology of rheumatic fever.

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

[DM 0822]

AUGUST 2022

Sub. Code :1421

D.M. – CARDIOLOGY

Paper I – BASIC SCIENCES

Q.P. Code: 161421

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on: **(2 x 15 = 30)**

1. Novel Biomarkers of Coronary Artery Disease Risk.
2. Cardiopulmonary Exercise Testing in Clinical cardiology.

II. Write notes on: **(10 x 7 = 70)**

1. Kaplan-meier curves.
2. Development of interventricular septum.
3. Role of anticoagulants in Covid -19 infection.
4. Thoracopagus.
5. Wedensky facilitation and Wedensky effect.
6. Role of echocardiography in assessment after orthotopic heart transplantation.
7. Myocardial perfusion imaging.
8. Arrhythmias in children.
9. Role of exercise test in chest pain units.
10. DIGAMI-2 TRIAL.

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

[DM 0124]

JANUARY 2024

Sub. Code: 1421

D.M. – CARDIOLOGY

PAPER I – BASIC SCIENCES

Q.P. Code: 161421

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 15 = 30)

1. Discuss the development of Aortopulmonary septum and its implications in various congenital anomalies.
2. Primary prevention of cardiovascular diseases and society guidelines regarding statin therapy.

II. Write notes on:

(10 x 7 = 70)

1. Functions of cardiac electrical system.
2. Role of Mexilitine in Heart.
3. Venous drainage of heart.
4. Autonomic dysfunction in the setting of intrinsic cardiac disease.
5. Thermodilution method.
6. Diastolic sounds.
7. ECG criteria for LVH.
8. Air pollution in cardiovascular system.
9. Scimitar syndrome.
10. Holter monitoring.

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

[DM 0824]

AUGUST 2024

Sub. Code: 1421

D.M. – CARDIOLOGY

PAPER I – BASIC SCIENCES

Q.P. Code: 161421

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on: (2 x 15 = 30)

1. Discuss the Cardiac action potential and mechanisms of arrhythmogenesis.
2. Discuss the principles of imaging and stress testing protocols in nuclear cardiology.

II. Write notes on: (10 x 7 = 70)

1. Physiological changes of circulation in pregnancy.
2. Newer antianginals.
3. Koch's triangle and its implication on EPS.
4. Autonomic dysfunction in the setting of structurally normal heart.
5. Fick's principle.
6. Dynamic auscultation.
7. Intraventricular conduction delays.
8. Echo beats.
9. Right atrial isomerism.
10. Ambulatory BP monitoring.

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

[DM 0225]

FEBRUARY 2025

Sub. Code: 1421

D.M. – CARDIOLOGY

PAPER I – BASIC SCIENCES

Q.P. Code: 161421

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 15 = 30)

1. Development of Inter atrial septum. Different types and its management including trans catheter therapy.
2. Draw Cardiac Action Potential. Discuss Electro mechanics of cardiac muscles contraction.

II. Write notes on:

(10 x 7 = 70)

1. Pericardial sinuses.
2. Heart rate variability.
3. Criss – cross Heart.
4. Bain bridge reflex.
5. Phlebostatic axis.
6. Trans Esophageal ECHO in cardiac interventions.
7. Diastolic sound.
8. Left atrial strain.
9. Sinus arrhythmia.
10. Calcium score.
