

**DIPLOMA IN CARDIAC NON-INVASIVE TECHNOLOGY  
SECOND YEAR  
PAPER II – ADVANCED CARDIOVASCULAR INVESTIGATIONS**

***Q.P. Code: 842412***

**Time : Three Hours**

**Maximum : 100 Marks**

**Answer All questions.**

**I. Elaborate on:**

**(3 x 10 = 30)**

1. Discuss in detail the types, indications, modes and complications of mechanical ventilation.
2. Discuss in detail the indications, types and technique of cardioversion.
3. Discuss in detail about basic life support.

**II. Write notes on:**

**(10 x 5 = 50)**

1. Discuss the concept of segmental analysis in paediatric echocardiography.
2. Discuss the various positions and views in transthoracic echocardiography.
3. What are the echocardiographic features of pulmonary hypertension?
4. What is a defibrillator and what are its parts?
5. Discuss about the infection control practices in a ICU.
6. Discuss about myocardial perfusion imaging and their advantages over other modes.
7. Discuss about the emergency medications used in a cardiac ICU.
8. How to set up a cath lab for percutaneous transluminal coronary angioplasty?
9. Discuss in detail about the modes, types and parts of a permanent pacemaker.
10. Discuss the procedure of atrial septal defect device closure.

**III. Short answers on:**

**(10 x 2 = 20)**

1. How is the aortic regurgitant volume calculated in echocardiography?
2. What are the echocardiographic findings in infective endocarditis?
3. What are the echocardiographic features of severe aortic stenosis?
4. What is the use of CPAP mode of ventilation?
5. What is the difference between a trans thoracic and trans oesophageal ECHO probe?
6. What are the cardiac rhythms that can be defibrillated?
7. How to give cardiac compressions during cardio pulmonary resuscitation?
8. What are the types of coronary angiographic catheters?
9. How can you do shunt calculation in ASD?
10. What are pacemakers and are their uses?

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**Time : Three Hours**

**Maximum : 100 Marks**

**Answer All questions.**

**I. Elaborate on:**

**(3 x 10 = 30)**

1. Discuss in detail the use of echocardiography in the diagnosis and complications of acute myocardial infarction.
2. Discuss in detail the principles of Doppler echocardiography and the application of colour, pulse and continuous wave Doppler in echocardiogram.
3. Discuss in detail the echocardiographic findings in mitral valve disease.

**II. Write notes on:**

**(10 x 5 = 50)**

1. What are transducers and what are the types used in cardiac echocardiography?
2. Discuss in detail the evaluation of diastolic dysfunction by echocardiography.
3. Echocardiographic assessment of a prosthetic valve.
4. Discuss the echocardiographic findings of hypertrophic cardiomyopathy.
5. Discuss about patient preparation for trans oesophageal echocardiogram.
6. Discuss the various components of hemodynamic monitoring of a patient in a cardiac ICU.
7. What are the cardiac rhythms that can be defibrillated and how to identify them?
8. Discuss about the various types of catheters used in a cardiac cath lab.
9. What are the angiographic views in coronary angiography?
10. Discuss about the measures to reduce the radiation exposure in a cath lab.

**III. Short answers on:**

**(10 x 2 = 20)**

1. What are the parts of an ultrasonogram?
2. What is the M mode finding in mitral stenosis?
3. What is the normal pulse wave Doppler study of the left ventricle?
4. What are the normal dimensions of left ventricle and intra ventricular septum?
5. What are the features of severe mitral regurgitation in echocardiogram?
6. What are the phases of korotkoff's sound in blood pressure measurement?
7. What are the uses of end tidal carbondioxide monitoring in a cardiac ICU?
8. What are the different positions of pads which could be placed during defibrillation?
9. What is hemoximetry?
10. What are the indications for percutaneous mitral commissurotomy?

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**I. Elaborate on:**

**(3 x 10 = 30)**

1. Discuss in detail about the indications and contraindications for percutaneous transluminal coronary angioplasty.
2. Discuss in detail about the catheters used, views, use of the power injector in left ventriculography.
3. Discuss in detail about the cinefluorographic system in a cardiac cath lab.

**II. Write notes on:**

**(10 x 5 = 50)**

1. Discuss the concept of pressure half time and continuity equation and their application in echocardiography.
2. What are the echocardiographic features of ventricular septal defects?
3. Discuss in detail the echocardiographic features of cardiac tamponade.
4. Discuss about the advantages and limitations of pulse oximetry.
5. Discuss the various modes of mechanical ventilation.
6. Discuss about patient preparation for a cardiac cath study.
7. Discuss about the post PCI procedure sheath care and sheath removal and its complications.
8. What are the Indications for cardiac catheterization?
9. Discuss the indications, contraindications and the procedure of permanent pacemaker implantation.
10. What are the indications and instruments needed for balloon mitral valvuloplasty?

**III. Short answers on:**

**(10 x 2 = 20)**

1. How to calculate stroke volume in echocardiogram?
2. What are the main echocardiographic features of tetralogy of Fallot?
3. What is the Doppler feature of coarctation of aorta?
4. Rhythms for which temporary pacemaker is used in an ICU?
5. What are the contraindications for CPAP ventilation?
6. What are the parts of a mechanical ventilator?
7. What are the instruments used in PDA closure?
8. What are the indications for pulmonary angiography?
9. What are the types of coronary stents and name some of them?
10. What are the contrasts used in cardiac cath lab and what are their complications?

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**Time : Three Hours**

**Maximum : 100 Marks**

**Answer All questions.**

**I. Elaborate on:**

**(3 x 10 = 30)**

1. Explain about the Echo features of Mitral stenosis and Mitral Regurgitation.
2. Write in detail about Diastolic Assessment and Grading's of Diastolic dysfunctions.
3. Explain in detail about Hemodynamic monitoring.

**II. Write notes on:**

**(10 x 5 = 50)**

1. Regional Wall Motion analysis, Regional wall motion score index.
2. Explain Mingo Graf, Angioscopy.
3. Explain all the Echo Views and draw Parasternal long axis and short axis views.
4. Difference between Pulse wave and Continuous wave Doppler.
5. M mode and Color flow Imaging or Indications, CI and Procedure of Pacemaker Implantation.
6. Explain MUGA scan and Radio nucleotide Ventriculography or Indications and preparation of Trans esophageal Echocardiography.
7. Explain the Indications for ventilator and modes of ventilation.
8. Explain Echo features and closure devices of ASD, VSD and PDA.
9. PISA method, continuity equation.
10. Explain Pulmonary Hypertension, How to diagnose pulmonary Hypertension in Echo?

**III. Short answers on:**

**(10 x 2 = 20)**

1. Explain situs solitus and situs inversus.
2. Define Medico-Legal Issues.
3. Explain PHT.
4. Echo features of Cor pulmonale.
5. BLS algorithm.
6. Define Mammography.
7. Explain Ebstein's Anomaly.
8. Normal ETCO<sub>2</sub> Range.
9. Explain systemic and pulmonary Flow ratio formula (Q<sub>p</sub>/Q<sub>s</sub>).
10. Index Myocardial Performance formula.

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**Time : Three Hours**

**Maximum : 100 Marks**

**Answer All questions.**

**I. Elaborate on:**

**(3 x 10 = 30)**

1. Discuss about the echocardiographic features of mitral stenosis. Explain in detail about valve area assessment.
2. Discuss in detail about patient care and Medicolegal issues.
3. Discuss in detail the types, indications, modes and complications of mechanical ventilation.

**II. Write notes on:**

**(10 x 5 = 50)**

1. Discuss about the Infection control practices.
2. Explain about pressure halftime and deceleration time.
3. Write about the Parts of Defibrillator and shockable rhythms in ECG.
4. Discuss about the echocardiographic features and types of atrial septal defect.
5. Explain about the complications of myocardial infarction.
6. Discuss about the echocardiography criteria for severe aortic regurgitation.
7. Discuss about the principles of asepsis.
8. What are all the indications and contraindications of PTMC?
9. Explain the echocardiographic features of Dilated cardiomyopathy.
10. Discuss the procedure of atrial septal defect device closure.

**III. Short answers on:**

**(10 x 2 = 20)**

1. Define fluoroscopy.
2. What is Coarctation of Aorta?
3. What are all the indications of permanent pacemaker implantation?
4. Define Capnography?
5. What is Nyquist Limit?
6. What are all the Doppler features of restrictive diastolic filling?
7. What is the formula for measuring Aortic valve area?
8. What is B-mode?
9. What is CVP?
10. What is Hemoximeter?

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**Time : Three Hours**

**Maximum : 100 Marks**

**Answer All questions.**

**I. Elaborate on:**

**(3 x 10 = 30)**

1. Explain about the angiography, indications, contraindications and views of angiography.
2. Explain in detail about the echo features of hypertrophic cardiomyopathy.
3. Explain in detail about MUGA scans.

**II. Write notes on:**

**(10 x 5 = 50)**

1. Explain PTMC and PTCA.
2. Echo complications in infective endocarditis.
3. Difference between cardioversion and defibrillation.
4. Explain the parts and modes of pacemaker.
5. Write about post cardiac catheterization management.
6. Write about X-ray generating system.
7. Explain about computed tomography.
8. Explain about the techniques of cardioversion.
9. Write about Myocardial perfusion imaging.
10. Explain about prosthetic valve assessment in echo.

**III. Short answers on:**

**(10 x 2 = 20)**

1. Name some emergency drugs used in resuscitation.
2. Define fluoroscopy.
3. Types of shock.
4. Common causes for airway obstruction.
5. BLS algorithm.
6. Contraindications for PTCA.
7. Define seizures.
8. Basic measures to reduce radiation exposure.
9. Define drowning.
10. Define PDA.

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

**[LR 1220]**

**DECEMBER 2020  
(AUGUST 2020 EXAM SESSION)**

**Sub. Code: 2412**

**DIPLOMA IN CARDIAC NON-INVASIVE TECHNOLOGY  
SECOND YEAR – (Regulation from 2014 -2015 & 2018-2019)  
PAPER II – ADVANCED CARDIOVASCULAR INVESTIGATIONS  
Q.P. Code: 842412**

**Time : Three Hours**

**Maximum : 100 Marks**

**Answer All questions.**

**I. Elaborate on:**

**(3 x 10 = 30)**

1. Write in detail about Pacemakers definition, Pacemaker indication, modes types and Procedures.
2. Explain in detail about Trans Thoracic Echo Cardiography views.
3. Hemodynamic Monitoring.

**II. Write notes on:**

**(10 x 5 = 50)**

1. Advanced Cardiac Life Support.
2. Coronary Angiography
3. Defibrillator.
4. Mammography.
5. Regional wall motion Abnormalities.
6. Magnetic Resonance Imaging.
7. Pacemakers.
8. Infection Control Practices.
9. Myocardial Infarction.
10. Ventricular Septal defect.

**III. Short answers on:**

**(10 x 2 = 20)**

1. Ebstein Anomaly.
2. C-Arm.
3. Hemoximeter.
4. Multiple gated Acquisitions Scans[ MUGA].
5. Left Ventriculography.
6. Situs Solitus.
7. Continuity Equation.
8. What is End Tidal Carbondioxide?
9. Cardiogenic Shock.
10. Radiopharmaceuticals .

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

**[AHS 0122]**

**JANUARY 2022**

**Sub. Code: 2412**

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

**DIPLOMA IN CARDIAC NON-INVASIVE TECHNOLOGY**

**SECOND YEAR – (Regulation from 2014 -2015 & 2018-2019)**

**PAPER II – ADVANCED CARDIOVASCULAR INVESTIGATIONS**

***Q.P. Code: 842412***

**Time: Three hours**

**Answer ALL Questions**

**Maximum: 100 Marks**

**I. Elaborate on:**

**(3 x 10 = 30)**

1. Basic life support and First Aid.
2. Cardiac Catheterization.
3. Hemodynamic monitoring.

**II. Write notes on:**

**(10 x 5 = 50)**

1. Trans-esophageal echocardiography.
2. Explain about regurgitant volume and regurgitant fraction.
3. Pulse oximetry.
4. Echocardiographic features and types of atrial septal defect.
5. Complications of myocardial infarction.
6. Modes of ventilation.
7. Doppler Echocardiography.
8. Complication of endocarditis.
9. Restrictive cardiomyopathy.
10. Cardioversion.

**III. Short answers on:**

**(10 x 2 = 20)**

1. Patent ductus Arteriosus.
2. Direct current shock.
3. Sphygmomanometer.
4. Tetralogy of fallot.
5. Pulse repetitive frequency.
6. Doppler features of restrictive diastolic filling.
7. Formula for measuring mitral valve area.
8. Principles of asepsis.
9. Deceleration time.
10. Parts of ultrasound.

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

**[AHS 0922]**

**SEPTEMBER 2022**

**Sub. Code: 2412**

**(FEBRUARY 2022 & AUGUST 2022 EXAM SESSIONS)**

**DIPLOMA IN CARDIAC NON-INVASIVE TECHNOLOGY**

**SECOND YEAR (Regulations from 2014-2015 & 2018-2019)**

**PAPER II – ADVANCED CARDIOVASCULAR INVESTIGATIONS**

***Q. P. Code: 842412***

**Time: Three hours**

**Maximum : 100 Marks**

**Answer ALL Questions**

**I. Elaborate on:**

**(3 x 10 = 30)**

1. Explain about the Echocardiographic assessment in mitral valve disease.
2. Discuss about Hemodynamic monitoring.
3. Discuss about the Echocardiographic features of Hypertrophic and Dilated cardiomyopathy.

**II. Write notes on:**

**(10×5=50)**

1. Atrial Myxoma.
2. Explain the complications in infective endocarditis.
3. Myocardial perfusion imaging.
4. Difference between cardio version and defibrillation.
5. Discuss about the indications for ventilator.
6. Discuss the indications, contraindications of permanent pacemaker implantation.
7. Explain steps in device closure of ASD.
8. Write about X-ray generating system.
9. Explain the Echo features of cardiac tamponade.
10. Discuss the various positions and views in transthoracic echocardiography.

**III. Short answers on:**

**(10×2=20)**

1. Define Nyquist limit.
2. Diagnosis of coarctation of aorta in echocardiogram.
3. Echocardiographic features of cor pulmonale.
4. Complication of mechanical ventilation.
5. Main Echocardiography features of Tetralogy of Fallot.
6. Types of coronary angiographic catheters.
7. Echo finding of severe aortic stenosis.
8. How to calculate stroke volume in Echocardiogram?
9. Name some emergency drugs used in resuscitation.
10. Normal ETCO<sub>2</sub> Range.

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