

# **SYLLABUS FOR THE POST OF ASSISTANT PROFESSOR IN CARDIO VASCULAR AND THORACIC SURGERY**

**CAT NO 025/2024**

**TOTAL : 100 MARKS**

## **Module 1 (Marks 10)**

### **Cardiac surgery- General considerations**

Anatomy, Dimensions, Terminology of

-Cardiac chambers and Major vessels, Atrial septum, Ventricular septum, Conduction system, Cardiac valves, coronary arteries, terminology and classification of heart diseases

Hypothermia, Circulatory arrest and Cardiopulmonary Bypass

1. Hypothermic circulatory arrest
2. Whole body perfusion during Cardiopulmonary Bypass
3. Clinical methodology of Cardiopulmonary Bypass
4. Clinical Methodology of Hypothermic circulatory arrest and its Alternat

Myocardial Management during Cardiac Surgery with Cardiopulmonary Bypass

Anesthesia for Cardiovascular Surgery

1. Anesthetic Consultation for Adult Cardiovascular Surgery
2. Anesthesia for Neonates and Child

Postoperative Care

1. Subsystem during Early Convalescence after Cardiac surgery

Cardiovascular subsystem, Pulmonary subsystem, Renal subsystem, Neuropsychological subsystem, Gastrointestinal subsystem, Endocrine subsystem, Hematologic subsystem, Immune subsystem

2. Special considerations after cardiac surgery

Fluid, Electrolyte, and Caloric intake, body temperature, Cardiac tamponade, Infection, Chylothorax, Postperfusion and post cardiectomy syndrome

## **Module2 (10 marks)**

### **ISCHEMIC HEART DISEASE**

#### **STENOTIC ARTERIOSCLEROTIC CORONARY ARTERY DISEASE**

Definition, History, Morphology, Clinical features and Diagnostic criteria, Natural history, indication for operation, Technique of operation, special features of postoperative care, Special situation and controversies

#### **LEFT VENTRICULAR ANEURYSM**

Definition, History, Morphology, Clinical features and Diagnostic criteria, Natural history, Technique of operation, Special features of Postoperative Care, Results, Indications for Operation, Special Situations and Controversies

#### **POSTINFARCTION VENTRICULAR SEPTAL DEFECT**

Definition, History, Morphology, Clinical features and Diagnostic criteria, Natural history, Technique of operation, Special features of Postoperative Care, Results, Indications for Operation, Special Situations and Controversies

#### **MITRAL REGURGITATION FROM ISCHEMIC HEART DISEASE**

Definition, History, Morphology, Clinical features and Diagnostic criteria, Natural history, Technique of operation, Special features of Postoperative Care, Results, Indications for Operation, Special Situations and Controversies

## **MODULE 3 (10 marks)**

### **ACQUIRED VALVAR HEART DISEASE**

#### **MITRAL VALVE DISEASE WITH OR WITHOUT TRICUSPID VALVE DISEASE**

Definition, History, Morphology, Clinical features and Diagnostic criteria, Natural history, Technique of operation, Special features of Postoperative Care, Results, Indications for Operation, Special Situations and Controversies

#### **MITRAL VALVE SURGERY WITH COEXISTING TRICUSPID VALVE DISEASE**

#### **MITRAL VALVE SURGERY WITH COEXISTING ISCHEMIC HEART DISEASE**

#### **AORTIC VALVE DISEASE**

Definition, History, Morphology, Clinical features and Diagnostic criteria, Natural history, Technique of operation, Special features of Postoperative Care, Results, Indications for Operation, Special Situations and Controversies

#### COMBINED AORTIC AND MITRAL VALVE DISEASE WITH OR WITHOUT TRICUSPID VALVE DISEASE

Definition, History, Morphology, Clinical features and Diagnostic criteria, Natural history, Technique of operation, Special features of Postoperative Care, Results, Indications for Operation, Special Situations and Controversies

#### TRICUSPID VALVE DISEASE

Definition, History, Morphology, Clinical features and Diagnostic criteria, Natural history, Technique of operation, Special features of Postoperative Care, Results, Indications for Operation, Special Situations and Controversies

#### INFECTIVE ENDOCARDITIS

Definition, History, Pathogenesis and Morphology, Clinical features and Diagnostic criteria, Natural history, Therapy and Technique of operation, Special features of Postoperative Care, Results, Indications for Operation, Special Situations and Controversies

### **MODULE 4 (10 marks)**

#### **OTHER CARDIAC CONDITIONS**

##### CARDIAC RHYTHM DISTURBANCE

Bradycardia

Tachycardia

Wolff-Parkinsons-White Syndrome

Atrial Fibrillation and Flutter

Ventricular Tachycardia and ventricular Fibrillation in Ischemic Heart Disease

Intractable Ventricular Tachycardia

#### **CARDIAC TRAUMA**

Penetrating Cardiac Trauma

Non-Penetrating Cardiac Trauma

## **CARDIAC TUMOR**

Myxoma

Papillary Fibroelastoma

Rhabdomyoma

Fibroma

Lipoma

Pheochromocytoma

Teratoma

Sarcoma

Carcinoid Heart disease

## **HYPERTROPHIC OBSTRUCTIVE CARDIOMYOPATHY**

### **MODULE 5 (10 marks)**

#### **CARDIOMYOPATHY**

HEART FAILURE

Dilated Cardiomyopathy.

Cardiac Transplantation and Mechanical circulatory Support

Ischemic Cardiomyopathy

Hypertrophic Cardiomyopathy

Restrictive Cardiomyopathy

Arrhythmogenic Right Ventricular Dysplasia

#### **CARDIAC TRANSPLANTATION**

Cardiac Transplantation in Adult without Congenital heart disease

Cardiac Transplantation for Congenital heart Disease and Pediatric Patients  
Heart lung Transplantation

## **MECHANICAL CIRCULATORY SUPPORT**

### **PERICARDIAL DISEASE**

Chronic Constrictive Pericarditis

Chronic effusive Pericarditis

## **MODULE 6 (10 marks)**

### **DISEASE OF THE THORACIC ARTERIES AND VEIN**

ACUTE TRAUMATIC AORTIC DISRUPTION

ACUTE AORTIC DISSECTION

CHRONIC AORTIC AND THORACOABDOMINAL AORTIC DISEASE

### **DISEASE OF THE PULMONARY ARTERIES**

Acute Massive Pulmonary Embolism

Chronic Pulmonary Thromboembolic disease

Pulmonary Artery Aneurysm

Pulmonary Artery Dissection

Pulmonary Artery Tumors

ACQUIRED DISEASE OF THE SYSTEMIC VEINS

### **CONGENITAL HEART DISEASE IN THE ADULT**

## **MODULE 7 (10 marks)**

### **CONGENITAL HEART DISEASE**

**Definition, Historical note, Morphology, Clinical features and diagnostic criteria, Natural history, Technique of operation, Special features of Postoperative care, Result**

ATRIAL SEPTAL DEFECT AND PARTIAL ANOMALOUS PULMONARY VENOUS CONNECTION

TOTAL ANOMALOUS PULMONARY VENOUS CONNECTION

COR TRIATRIATUM

UNROOFED CORONARY SINUS SYNDROME

ATRIOVENTRICULAR SEPTAL DEFECT

VENTRICULAR SEPTAL DEFECT

CONGENITAL SINUS OF VALSALVA ANEURYSM AND AORTICO-LEFT VENTRICULAR TUNNEL

PATENT DUCTUS ARTERIOSUS

VENTRICULAR SEPTAL DEFECT WITH PULMONARY STENOSIS OR ATRESIA

PULMONARY STENOSIS AND INTACT VENTRICULAR SEPTAM

PULMONARY ATRESIA AND INTACT VENTRICULAR SEPTAM

TRICUSPID ATRESIA AND SINGLE-VENTRICLE PHYSIOLOGY

EBSTEIN ANOMALY

TRUNCUS ARTERIOSUS

AORTOPULMONARY WINDOW

ORIGIN OF THE RIGHT OR LEFT PULMONARY ARTERY FROM THE ASCENDING AORTA

CONGENITAL ANOMALIES OF THE CORONARY ARTERIES COMPLETE

CONGENITAL AORTIC STENOSIS

COARCTATION OF THE AORTA AND INTERRUPTED AORTIC ARCH

AORTIC ATRESIA AND OTHER FORMS OF HYPOPLASTIC LEFT HEART PHYSIOLOGY

CONGENITAL MITRAL VALVE DISEASE

VASCULAR RING AND SLING

COMPLETE TRANSPOSITION OF THE GREAT ARTERIES

DOUBLE OUTLET RIGHT VENTRICLE

DOUBLE OUTLET LEFT VENTRICLE

CONGENITALLY CORRECTED TRANSPOSITION OF THE GREAT ARTERIES  
DOBLE INLET VENTRICLE AND ATRETIC ATRIOVENTRICULAR VALVE  
ANATOMICALLY CORRECTED MALPOSITION OF THE GREAT ARTERIES

## **MODULE 8 (10 marks)**

### **GENERAL THORACIOC SURGERY**

#### **THE LUNG, PLEURA, DIAPHRAGM, AND CHEST WALL**

##### STRUCTURE AND FUNCTION OF THE CHEST WALL AND LUNGS

Anatomy of the Thorax, Surface anatomy of the thorax, cutaneous innervation, superficial chest wall musculature, the intercostal space, the intercostal muscles, Neurovascular bundle, intercostal vessels, interactions between the components of the chest wall during respiration,

Embryology of the lung

Ultrastructure and Morphometry of the Human Lung

Cellular and Molecular Biology of the Lung

Surgical Anatomy of the Lungs, lymphatics of the Lungs

Mechanics of Breathing and Pulmonary gas Exchange

Thoracic Imaging - Standard Radiographic evaluation, Computed tomography, Magnetic Resonance imaging, Radionucleotide studies of the lung, Thoracic PET CT

##### DIAGNOSTIC PROCEDURES

Laboratory investigations in the diagnosis of pulmonary disease

Molecular diagnostic studies and Genomic studies in pulmonary disease

Bronchoscopic evaluation of the lung and tracheobronchial tree

Ultrasound and endoscopic Bronchoscopic ultrasound in the evaluation of the Lungs , Mediastinum and Pleura

Mediastinoscopy

Invasive diagnostic procedures

Preoperative assessment of the Thoracic Surgical patients

## PULMONARY RESECTIONS

Technical aspect of Lobectomy

Pneumonectomy and its modifications

Sleeve lobectomy

Tracheal sleeve pneumonectomy

Segmentectomy and lesser pulmonary resections

Robotic -Assisted surgery in pulmonary diseases

Video-Assisted Thoracoscopic surgery

Uniport VATS Lobectomy

Awake, Non-Intubated Trans pleural Surgery

Post operative management of the General Thoracic Surgery patient

Complications of Thoracic surgical patients

## **MODULE 9 (10 marks)**

### THE CHEST CAGE

Chest wall deformities

Hernias of the chest wall

Infections of the chest wall

Thoracic outlet syndrome

Chest wall tumors

Chest wall reconstruction

### THE DIAPHRAGM

Embryology and anatomy of the diaphragm

Physiology of the diaphragm and Surgical approaches to the Paralyzed diaphragm

Diaphragmatic hernia



Primary tumors of the diaphragm

## THE PLEURA

Anatomy of the Pleura

Absorption of Gases in the pleural space

Pneumothorax

Mechanics and Fluid dynamics of Lung and Pleural space

Benign pleural effusion

Parapneumonic Effusion, Empyema and Fibrothorax

Post surgical empyema

Tuberculous and Fungal Infections of the Pleura

Thoracoplasty. Indications and Surgical considerations

Anatomy of the Thoracic duct and Chylothorax

Pleural neoplasm - Surgical approaches for malignant pleural mesothelioma, Chemotherapy

Malignant pleural Effusion

## THE TRACHEA AND BRONCHI

Tracheostomy

Therapeutic Bronchoscopic Procedures

Surgical anatomy of the Trachea and Techniques of Resection and Reconstruction

Benign and Malignant tumors of the Trachea

Compression of the Trachea by Vascular Rings

## CONGENITAL, STRUCTURAL, AND INFLAMMATORY DISEASES OF THE LUNG

Congenital parenchymal Lesions of the lung

Pulmonary complication of Cystic Fibrosis

Congenital vascular lesions of the lung

Chronic pulmonary emboli

COPD for CT surgery

Bullous and bleb diseases of the lung

Bacterial infections of the lungs and Bronchial Compressive disorders

Surgical management of Tuberculous and Non-tuberculous Mycobacterial infections of the lung

Thoracic Mycotic and Actinomycotic Infections of the Lung

LUNG TRANSPLANTATION

CARCINOMA OF THE LUNG

Epidemiology and carcinogenesis, Lung cancer screening, Investigation and management of indeterminate Pulmonary Nodule, Pathology of Carcinoma of the Lung, Ex Vivo diagnosis of Lung Cancer, Staging of Lung Cancer, Results of Surgical treatment of Non-Small cell Lung Cancer, Mediastinal lymph node dissection, Adjuvant chemotherapy for Lung cancer, Radiation for Lung Cancer, Multimodality Therapy for Non-small cell Lung Cancer, Novel therapeutic strategy for Non-small cell Lung Cancer, Small cell Lung Cancer

THORACIC TRAUMA

Blunt and Penetrating injuries of the Chest Wall, Pleura, Diaphragm, and Lungs

Barotrauma and inhalation injuries

Acute Respiratory Distress Syndrome

Managements of Foreign bodies of the Aerodigestive Track

Blunt and Penetrating injuries of the Esophagus

Esophageal Perforation

THE ESOPHAGUS

Structure of the Esophagus, Physiology of the Esophagus

Diagnostic Studies of the Esophagus.

Operative procedures in the Management of Esophageal disease

Malignant lesions of the esophagus

MEDIASTINUM

Structure and function of the Mediastinal contents

Noninvasive investigations

Invasive Diagnostic Investigations and Surgical Approaches

Mediastinal Infections, Mass lesion in the Mediastinum, control of Vascular Obstructing Symptomatology

Primary Mediastinal Tumors and Syndromes Associated with Mediastinal Lesions

Mediastinal Cysts

## **MODULE 10 (10 marks)**

### **VASCULAR SURGERY AND ENDOVASCULAR THERAPY**

Embryology and Developmental Anatomy, Vessel wall Biology, Atherosclerosis

Intimal hyperplasia, ischemia reperfusion, Arterio genesis and Angio genesis, Arterial hemodynamics, Venous Pathophysiology, Lymphatic Pathophysiology,

Atherosclerotic risk factors

Clinical and Vascular laboratory evaluation

Vascular imaging- Arteriography, Venography, Computed Tomography, Magnetic Resonance Imaging and Arteriography, Vascular PET/CT and SPECT/CT, Intra Vascular Ultra sound,

Preoperative evaluation and management

Intraoperative management

Post operative management

Hospital Readmission in Vascular Surgery

Normal coagulation, coagulopathy and hemorrhage, Hypercoagulable state

Anticoagulant drugs, Antiplatelet agents, Thrombolytic agent,

Graft thrombosis, Graft infection Anastomotic aneurysms

Local endovascular complication and their management

Venous complications

Thoracic and Thoracoabdominal vascular exposure, abdominal vascular exposure,

Cerebrovascular exposure, Lower extremity vascular exposure, Upper extremity vascular exposure, Spinal operative exposure

Endovascular diagnostic technique

Endovascular Therapeutic technique

Laparoscopic and Robotic Aortic Surgery

Grafts and Devices- Autogenous grafts, Prosthetic grafts, Biological Grafts, Bioengineered vascular grafts, Nonaortic Stents and Stent grafts,

Novel and Evolving Aortic Endovascular devices

Abdominal Aortic and Iliac Aneurysm

Endovascular Aneurysm repair technique

Ruptured Aortoiliac aneurysm and their Management

Thoracic and Thoracoabdominal Aortic aneurysm and Dissection

Fenestrated and Branched Endograft treatment of Juxta renal, Para visceral, Thoracoabdominal and Aortic arch Aneurysm

Peripheral and splanchnic aneurysm

Cerebrovascular disease

Acute limb ischemia

Lower extremity Chronic arterial disease

Thoracic outlet syndrome

Renovascular disease

Thrombo angiitis obliterans

Venous thromboembolic disease

Pulmonary embolism

Vascular malformation

Vascular trauma

**NOTE: - It may be noted that apart from the topics detailed above, questions from other topics prescribed for the educational qualification of the post may also appear in the**

**question paper. There is no undertaking that all the topics above may be covered in the question paper.**

