

**SYLLABUS FOR THE POST OF ASSISTANT PROFESSOR IN  
PULMONARY MEDICINE IN MEDICAL EDUCATION DEPARTMENT**

**CAT NO: 370/2024 - TOTAL MARKS : 100**

**Module 1 – 10 marks (Preclinical subjects)**

1. Anatomy - Structure of lungs, pleura and mediastinum, diaphragm, blood supply, lymphatics and lymph nodes, thoracic duct
2. Development (embryology) & aging of respiratory system
3. Respiratory Physiology, Control of ventilation; pulmonary mechanics, Ventilation, pulmonary blood flow, gas exchange and transport, Non-respiratory metabolic functions of lung Inhalation kinetics and its implication in aerosol therapy, and sputum induction etc., Acid-base and electrolyte balance, Pulmonary innervation and reflexes, Immunology & Pulmonary defence mechanisms, Physiological changes in pregnancy.
- 4- Pathophysiology of common lung diseases
- 5- Microbiology- common bacterial, viral, fungal, protozoal organisms and parasites
- 6- Pharmacology of commonly used drugs for respiratory diseases- antimicrobial drugs, antineoplastic and immunosuppressant drugs, Bronchodilator and anti-inflammatory drugs used in pulmonary diseases, Drugs used in viral, fungal and parasitic infections, antifibrotics, Pharmacovigilance, antibiotic stewardship
7. Pathology of common lung diseases including TB, lung cancer, ILD
- 8 . Epidemiological terms and their definitions, Epidemiological methods, Research methodology, statistics and study designs. Evidence based medicine, Quality of life measures, Public health issues

**Module 2 – Airway diseases – 10 marks**

- 1- Asthma – including inhaler therapy, bronchial thermoplasty, biologicals, difficult asthma, most recent GINA guidelines
- 2- Acute Bronchitis
- 3- Chronic bronchitis/ COPD- including lung volume reduction procedures, most recent GOLD guidelines, Pulmonary rehabilitation

- 4-Bronchiolitis
- 5-Bronchiectasis
- 6-Airway Stenosis, tracheomegaly & tracheomalacia
- 7-Tracheoesophageal Fistula
- 8-Upper airway disease
- 9-Vocal cord Dysfunction
- 10-FB aspiration
- 11-Bullous disease

### **Module 3- Thoracic Tumours and maligncies – 10 marks**

- 1-Lung cancer – including classification, diagnosis, TNM staging, treatment – chemo, radiation, surgery, targeted therapy, immunotherapy, lung cancer screening, SPN, paraneoplastic syndromes
- 2-Metastatic Pulmonary tumours
- 3-Mesothelioma, Metastatic & Other pleural tumours, pleural fibroma
- 5-Benign intrathoracic tumours – adenoma, carcinoid tumour
- 6-Mediastinal tumours
- 7-Chest wall tumours
- 8-Sarcoma, kaposi's sarcoma
- 9-Lymphoma, leukemia and related diseases.
- Inflammatory Myofibroblastic Tumor

### **Module 4 - Non TB Respiratory Infections – 10 marks**

- 1- Upper Respiratory Infections
- 2- Lower respiratory infections
- 3- Community acquired pneumonia
- 2- Nosocomial pneumonia
- 5- Pneumonia in the immunocompromised host
- 6- Other pneumonias - aspiration, chemical
- 7- Lung abscess
- 8- Fungal infections

- 19- Parasitic infections
- 10-Viral infections
- 11- Atypical pneumonia
- 12- Zoonosis and protozoan infections
- 13- Pneumocystis jirovecii infection

#### **Module 4 – Tuberculosis & NTM – 10 marks**

- 1-Pulmonary TB
- 2- Extrapulmonary TB
- 3- TB in the immunocompromised host
- 4- Latent TB infections
- 5- Non tuberculous mycobacterial diseases
- 6- Drug resistant Tuberculosis
- 7- Tuberculosis control programme
- 8 - Hiv and tb

Laboratory diagnosis of TB including staining, culture and drug sensitivity testing

Anti TB drugs – primary and second line, new drugs, BCG vaccine, new vaccines, new diagnostic tests in TB

#### **Module 5 – ILD, Pulmonary Vascular diseases & orphan lung disease – 10marks**

Sarcoidosis, Idiopathic Interstitial pneumonias including Idiopathic Pulmonary Fibrosis (IPF), NSIP, COP, AIP, RB-ILD, DIP, LIP, IPAF, CPFE, PPFE, Cryptogenic organizing Pneumonia, Bronchiolitis obliterans Syndrome (BOS), Interstitial lung diseases specific to Infancy and children , CTD – ILD – Systemic sclerosis, RA ILD , PMDM, Hermansky, Pudelak syndrome

Pulmonary Embolism, Fat embolism, Pulmonary edema, Pulmonary Hypertension, Cor Pulmonale, CTEPH, Vasculitis and Diffuse pulmonary hemorrhage, Abnormal A-V communication, Hepatopulmonary Syndrome

## **Orphan Lung diseases**

Langerhans cell histiocytosis, Lymphangioleiomyomatosis, BHD, Pulmonary alveolar proteinosis, Amyloidosis & other depositional disorders

GERD & lung, Castleman's disease, yellow nail syndrome, Lipoid pneumonia, Diffuse Idiopathic Pulmonary Neuroendocrine Cell Hyperplasia

## **Module 6 – Occupational, Iatrogenic, Allergic, Genetic and Developmental Disorders, Environmental Diseases - 10 marks**

Occupational Asthma, Reactive airway dysfunction syndrome, coal worker's Pneumoconiosis, Asbestos related Disease, silicosis, berylliosis, byssinosis, bagassosis

Hypersensitivity pneumonitis, Dust and Toxic gas inhalation disease, Indoor pollution related diseases, - Outdoor pollution related disease, Smoking related disease & smoking cessation, Vaping, E cigarettes, High altitude physiology & Disease, Diving related disease, Aviation and sports related pulmonary disorder, Disability evaluation and compensation, Inhalation Lung Injury, Traumatic thoracic injury, Aerospace medicine - Climate change and lungs, Global warming - Cystic Fibrosis. Primary Ciliary Dyskinesia, Alpha-1 antitrypsin deficiency - Agenesis, Aplasia and Hypoplasia, Sequestration, congenital lobar emphysema, bronchogenic cysts

## **Module 7 – Intensive care – 10 marks**

**Respiratory Failure-** Acute Lung Injury and Acute Respiratory Distress Syndrome, Type II, III & IV respiratory Failure - Intubation

Mechanical ventilation – Invasive & NIV, VILI, weaning, PEEP, prone ventilation, Modes of ventilation

Acid base disorders

Electrolyte imbalance

Oxygen therapy & Oxygen toxicity, HFNC, LTOT, ECMO

Cardiopulmonary resuscitation

Sepsis, MODS

Respiratory and hemodynamic monitoring in acute resp failure

Severity of illness scoring system

## **Module 8 - Pleural, diaphragm, chest wall, allergy, mediastinal and respiratory muscles Diseases – 10 marks**

Pleurisy, Pleural Effusion, Chylothorax, Haemothorax, Fibrothorax, Pneumothorax, Parapneumonic effusion & Empyema, pleural manometry

Chest wall deformities, Neuromuscular disorders, Phrenic Nerve Palsy, Diaphragmatic hernia, eventration, rupture

Mediastinitis, Mediastinal Fibrosis, Pneumomediastinum, Mediastinal cysts

Preoperative respiratory evaluation

Post operative care and lung complications

## **Allergic & Eosinophilic Diseases**

Allergic rhinitis, anaphylaxis, Urticaria, atopic dermatitis, eczema, food allergy, drug allergy, Allergen Immunotherapy, Allergic Bronchopulmonary aspergillosis, SAFS

Non-asthmatic eosinophilic bronchitis, Acute and chronic eosinophilic pneumonia, Hypereosinophilic syndrome, Churg-Strauss syndrome, Tropical pulmonary eosinophilia, Loeffler's syndrome

## **Module 9 - Investigations & Interventions in Respiratory diseases- 10 marks - Symptoms and Signs**

Dyspnoea, Wheeze, Stridor, Hoarseness, Cough, Sputum production, Chest Pain, Haemoptysis, Snoring, Day time somnolence

Cyanosis, abnormal breathing patterns, finger, edema, clubbing, chest wall deformities, superior vena cava syndrome and Horner's syndrome

Pulmonary Function Testing -Static and Dynamic Lung Volumes- Interpretation and Performance

Body Plethysmography – Interpretation

Gas transfer (DLCO) - Interpretation

Blood gas assessment and Oximetry-Interpretation and Performance

Bronchial provocation testing- Interpretation and performance

Cardiopulmonary exercise testing- Interpretation and performance  
Assessment of respiratory mechanics- Interpretation  
Compliance measurements - Interpretation  
Respiratory muscle assessment – Interpretation  
Ventilation perfusion measurement – Interpretation  
Shunt measurement – Interpretation  
Measurement of regulation of ventilation- Interpretation  
Impedance oscillometry  
Blood test and serology relevant to Respiratory medicine  
Analysis of exhaled breath components including NO, CO and breath condensate  
Sputum induction & Sputum analysis  
Liquid biopsy  
Tuberculin skin testing, IGRA  
Allergy skin testing – SPT, Intradermal testing  
Thoracic ultrasound imaging

## **Procedures**

Thoracentesis  
Pleurodesis  
Intercostal tube drainage, indwelling pleural catheters  
Closed needle pleural biopsy  
Medical thoracoscopy, VATS, mediastinoscopy  
Rigid bronchoscopy & Flexible bronchoscopy  
Transbronchial lung biopsy  
Transbronchial needle aspiration  
Endobronchial ultrasound  
Bronchialveolar lavage  
Bronchography  
Transthoracic needle aspiration & biopsy  
Fine needle lymphnode aspiration for cytology  
Right heart catheterization

V/Q scan

Fluoroscopy

Interventional bronchoscopic technique including fluorescent bronchoscopy, brachytherapy, endobronchial radiotherapy, afterloading laser and electrocoagulation cryotherapy, Photodynamic therapy and airway stents. Endobronchial therapies, Brachytherapy

Complications of invasive procedures

### **Procedures performed collaboratively**

Thoracic imaging ( X-ray, CT, MRI), CT pulmonary angiogram

Nuclear medicine techniques (Pulmonary and Bone scan PET)

Electrocardiogram

Echocardiography

Ultrasound

Capneography

Transoesophageal ultrasound

Oesophageal pH monitoring

Cytology/Histology

Microbiology testing

### **Module 10 – Miscellaneous – 10 marks**

#### **Specific Treatment modalities and prevention measures**

Palliative care & end of life care

Nutritional interventions

Gene therapy

Principles of stem cell therapy

Vaccination and infection control

#### **Sleep related disorders**

Physiology of sleep, Obstructive sleep apnoea, Central sleep apnoea, Upper airway resistance syndrome, Obesity hypoventilation syndrome, sleep study

## **Immunodeficiency disorders**

Congenital immunodeficiency syndrome, Acquired immunodeficiency syndrome, HIV related diseases, Graft versus host diseases

Lung transplantation & Post-transplantation immunodeficiency

Diabetes and lung, Lung in IBD, ulcerative colitis

Respiratory Diseases and Pregnancy

Pregnancy induced respiratory diseases

Drug induced lung diseases

Radiation induced Disease

Lung in sickle cell disease, multiple myeloma

Pleuropulmonary manifestations of systemic/ Extrapulmonary disorders in Collagen vascular disease, Cardiac disease, Abdominal disease, Haematological disease, Obesity, Hyperventilation syndrome

**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.**