Detailed Syllabus for the post of Assistant Professor in Pulmonary Medicine

Category No.689/2025

Total -100 marks

Module	Theme	Marks Proportion
1.	Core Basic Science concepts	5%
2.	Airway diseases	15%
3.	Infections including Tuberculosis	10%
4.	Diffuse parenchymal Lung diseases & Rare Lung diseases	10%
5.	Pleural ,Chest Wall,Diaphragm &Pulmonary Vascular disorders	10%
6.	Thoracic Malignancies & Advanced Endoscopic Interventions	15%
7.	Multidisciplinary Critical care	15%
8.	Pediatric and Childhood Lung diseases	5%
9.	Sleep, Neuromuscular disease,Obesity and Control of Breathing	10%
10.	Systemic disorders and Miscellaneous	5%
	Total Marks	**100%**

Module 1 – Core Basic Science concepts (5%)

- Anatomy and development of lungs, airways, pleura, diaphragm, mediastinum (as needed for imaging, procedures, staging)
- Respiratory mechanics, ventilation–perfusion, diffusion, oxygen and carbon dioxide transport, control of breathing
- Pathophysiological approach to hypoxemia, hypercapnia and respiratory failure
- Interpretation of Advanced Pulmonary function tests including Cardiopulmonary exercise testing.
- Acid–base disorders and arterial blood gas interpretation patterns
- Core microbiology: pyogenic bacteria, atypical pathogens, TB/NTM, fungi, Pneumocystis, respiratory viruses (influenza, RSV, others).
- Core pharmacology: inhaled bronchodilators, ICS/LABA/LAMA, systemic steroids, Biologics for asthma and COPD, antifibrotics, major antimicrobial classes used in practice.
- Basic epidemiology and evidence based medicine concepts commonly tested (sensitivity, specificity, likelihood ratios, Hazard ratio, NNT, cohort vs RCT).

Module 2 – Airway diseases (15%)

- Asthma: Diagnostic spirometry especially to differentiate from mimickers, GINA stepwise therapy, Acute severe asthma, Biologics and indications, difficulttotreat asthma approach.
- COPD: COPD exacerbation management, longterm oxygen therapy indications ,Domiciliary Non Invasive ventilation, Pulmonary rehabilitation.
- Smoking, Vaping and ecigaretterelated lung injury; smoking cessation strategies.
- Bronchiectasis: aetiology workup (CF, immune, ABPA, NTM), CT pattern recognition for aetiology, airway clearance techniques, chronic macrolide/antibiotic strategy, Pseudomonas eradication and Chronic airway infection treatment.
- Small airway disease/bronchiolitis,constrictive bronchiolitis, Diffuse panbronchiolitis, posttransplant BOS (only core concepts).

- Central airway obstruction (tumour, Inflammatory,post infectious/Post Intubation tracheal stenosis, tracheomalacia, Expiratory dynamic airway collapse,): recognition, when to consider interventional bronchoscopy or stenting.
- Upper airway and vocal cord dysfunction vs asthma; foreignbody aspiration – classic scenarios and bronchoscopic removal techniques.

Module 3 – Infections including Tuberculosis (10%)

- Communityacquired pneumonia: severity scores, empiric therapy choices, parapneumonic effusion/empyema management as per latest guidelines.
- Hospitalacquired and ventilatorassociated pneumonia: diagnostic approach and key prevention bundles.
- Interpretation of Gene sequencing results of microbiological resistance patterns and Management of MDR bugs including Carbapenem resistant Enterobacteriacea/ Acinetobacter infections.
- Opportunistic infections: Pneumocystis carinii Pneumonia, Nocardiosis, CMV, Invasive aspergillosis, Strongyloidosis, pneumonias in immunocompromised host
- Pulmonary TB (smear, NAAT, culture), standard drugsensitive regimens,Latent TB diagnosis and treatment,Management of systemic complications related to TB
- MDR/XDR TB – highyield principles of regimen construction and when to suspect.
- NTM lung disease: diagnostic criteria (clinical, radiologic, microbiologic) and common organisms (MAC, M. kansasii, M. abscessus).
- Fungal infections especially Chronic Cavitary and Chronic Fibrotic Pulmonary Aspergillosis.
- Diagnosis and Treatment of Inborn errors of Immunity especially Common Variable Immunodeficiency
- Adult vaccination

Module 4 – Diffuse parenchymal Lung diseases & Rare Lung diseases (10%)

- ILD approach: All HRCT patterns of DPLD, when to consider MDD and biopsy

  IPF, idiopathic interstitial pneumonias, Bronchiolocentric Interstitial Pneumonia, Drug induced ILD, Smoking related Interstitial Pneumonias, Cystic ILD : hallmark features,

key clinical clues and management principles, antifibrotics and prognostic markers including role of KL-6.

- Pulmonary Infiltrates with Eosinophilia disorders
- Pulmonary manifestations of Systemic Vasculitis and Connective tissue diseases
- Sarcoidosis- Pulmonary and extrapulmonary involvement especially Neuro,Cardiac and Renal sarcoidosis.
- Pneumoconioses (silicosis, asbestosis, coal worker) and occupational asthma – classic exposures and imaging.
- Environmental/airpollution and highaltitude syndromes –mechanisms and clinical patterns.
- Familial ILD and Rare ILD's-clinical patterns and radiology, Genetic markers and role of genetic screening and counselling.
- All aspects of Lung transplantation with special relevance to post transplant complication management.

Module 5 – Pleural ,Chest Wall,Diaphragm,Pulmonary Vascular disorders (10%)

- Pleural effusion: Modifications to Light's criteria, common and rare etiologies, indications for thoracentesis and chest tube, MIST trials and its Interpretation, Hemothorax, Post Cardiac Injury syndrome, Drug induced effusions.
- Pneumothorax: primary vs secondary, indications for observation vs aspiration vs chest tube, tension pneumothorax recognition.
- Pulmonary embolism: Wells/Geneva,YEARS algorithm and ddimer use, imaging choices,anticoagulation and thrombolysis.
- Pulmonary hypertension: WHO groups, highyield therapy principles for group 1 vs other,Severe PH phenotype related to Lung diseases, Chronic thromboembolic Pulmonary hypertension and its management.
- Chest wall deformity and neuromuscular weakness causing chronic hypoventilation – when to suspect, Management principles including long term Non invasive ventilation, Cough assist devices.
- Diaphragmatic paralysis/eventration – when to clinically suspect ,role of Pulmonary function tests and imaging. Diaphragm pacing

Module 6 – Thoracic malignancies (10%) & Advanced Endoscopy interventions (15%)

- Lung cancer: risk factors and special emphasis on screening with lowdose CT-PLCOM strategy, Lung RADS imaging; solitary pulmonary nodule/mass risk assessment algorithms. All paraneplastic syndromes and presentations in detail
- NSCLC,SCLC: key clinicoradiologic distinctions, pathology Immunohistochemistry patterns for type of Lung cancer, staging overview, central versus peripheral lesions. Management outlines: surgery, radiation, chemoradiation, targeted therapy and immunotherapy – when each is typically used.
- Rare Pleural tumours including Mesothelioma
- Malignant pleural effusion – diagnostic approach and palliative strategies including when to consider In dwelling Pleural Catheter, Role of Pleural manometry and pattern recognition of various pressure drop graphs
- Mediastinal masses and approach, Management of Thymomas in detail.
- Oncologic pulmonary emergencies –Recognition and Management specially focussing on Endoscopic treatment of massive hemoptysis, SVC syndrome including SVC stents, Endoscopic management of Malignant Airway obstruction ,Immunotherapy related pulmonary complications, Oncology drugs induced Respiratory failure
- Linear EBUS procedure principles, staging,technical aspects
- Radial EBUS and principles,Navigational Bronchoscopy and role in Peripheral Pulmonary Lesions
- Cryotherapy and cryoextraction ,Management of Foreign body in airways Argon plasma coagulation,Electrocautery principles
- Rigid bronchoscopy ,Airway dilation ,Airway stenting and its technical aspects

  Thoracoscopy and pleurodesis

Module 7 – Multidisciplinary Critical care (15%)

- Definitions and classification of acute and chronic respiratory failure; ARDS criteria and lungprotective ventilation principles(Plateau and driving pressure).Prone ventilation principles and physiology including important Trials

- Invasive and noninvasive ventilation: All basic and advanced modes, settings, recognition and management of patient–ventilator asynchrony including Self inflicted Lung Injury,graphics interpretation.
- Difficult weaning including patient management on prolonged ventilation
- Sepsis and septic shock – Screening and early management bundle elements, Recognition and initial management of multiorgan dysfunction (renal, hepatic, cardiovascular, neurologic).
- Shock and hemodynamics- Types of shock with classic bedside scenarios. Initial fluid resuscitation strategy, vasopressor choices including titration concepts, Bedside hemodynamic assessment of shock (lactate, MAP, urine output, echo points).
- Oxygen therapy (including HFNC),ECMO,ECCO2 and trouble shooting, Oxygen prescription for air travel, Oxygen source duration calculation for patient transport, Various Oxygen provisions in Hospital facilities and quantifying Hospital Oxygen stores and duration the Oxygen store will last with current consumption
- ICU complications:Delirium, DVT and Pulmonary Embolsim, stress ulcer and line infections (prevention focus),Critical Illness Neuro/Neuromyopathy,
- Multisystem problems commonly handled by DM Pulmonary/Critical care Intensivists

- Acute kidney injury in ICU – recognition, indications for renal replacement
- Acute cardiac issues in ICU – decompensated heart failure, arrhythmias, demand ischemia basics.
- Acute neurologic deterioration – delirium recognition, encephalopathy, basic approach to decreased consciousness in ICU.
- Poisoning –Drugs ,Substance abuse,Pesticide and Insecticide,Snake/insect bite
- Periarrest and postarrest care including Targeted temperature concept and Prognostic considerations and discussion with family
- Nutrition in the critically ill, glycemic control principles, early mobilization basics.
- Sedation, analgesia
- Breaking bad news, Ethics and principles of End of life care and Withdrawal of Life sustaining treatment principles

Module 8 – Pediatric and childhood Lung diseases (5%)

- Acute management(Bronchiolitis, Croup, Recurrent wheezy child, Atypical Pneumonias)

- Congenital and Anatomical Lung diseases- Tracheoesophageal fistula, Vascular sling/ring, Airway webs, Laryngomalacia/Congenital Laryngeal stridor, CPAM, Sequestration, Bronchial atresia, Bronchogenic cysts,
- Childhood Interstitial Lung diseases-Clinical Approach including extrapulmonary features and radiological pattern interpretation including Surfactant deficiency and dysfunction disorders, Chronic lung disease of Immaturity.
- Cystic fibrosis, Primary ciliary dyskinesias-Suspicion,Diagnosis,Radiology interpretation and management
- Pediatric Sleep disordered breathing and Respiratory management of a Child with neuromuscular weakness like Spinomuscular atrophy.

Module 9 – Sleep, neuromuscular, obesity, control of breathing (10%)

- Obstructive sleep apnoea: classic risk factors, STOPBANG, Polysomnography findings and CPAP indications, Role of GLP-1 agonists and recent trials.
- Central sleep apnoea and Cheyne–Stokes breathing with typical associations (heart failure, opioids).
- Obesity hypoventilation syndrome – diagnostic criteria and management
- Complex apnoea, Upper airway resistance syndrome, Congenital central alveolar Hypoventilation.
- REM related disorders, Sleep related breathing disorders especially related to Lung diseases,Periodic Limb movements in Sleep,Narcolepsy.
- Breathing control in Neurological diseases like Parkinsonism, Stroke, Motor Neuron disease.

Module 10 – Systemic / miscellaneous (5%)

- Thoracic surgeries, Preoperative fitness and postoperative Lung care
- Management of Diabetes, Myocardial infarction and Coronary artery disease, Arrythmia recognition and management, Right and Left heart failure, Chronic Kidney disease/Chronic Liver disease and its respiratory manifestations, Hematological malignancies and pulmonary care
- Adrenal insufficiency and management in patients with Lung diseases.
- Methemoglobinemia, Carboxyhemoglobin toxicity, Smoke inhalation injury and management.

- Right heart catheterisation and basic interpretation.
- Palliative care in Lung diseases.

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