Syllabus for the descriptive Subject Aptitude Test (SAT) for the recruitment to post of Assistant Professor (Tuberculosis and Respiratory Diseases), Class-I (on regular basis) in the Department of Medical Education & Research, H.P. The SAT shall be of 03 hours duration having 120 Marks. The SAT paper shall have two parts i.e. Part-I and Part-II and cover the following topics of M.D. (Tuberculosis)/ M.D., M.R.C.P in Medicine with T.D.D., D.T.D or D.T.C.D. level.

PART-I (60 Marks)

1. Basic Sciences:

A. Anatomy and Histology of Respiratory System

- Development and Anatomy of Respiratory System,
- Applied embryology of lungs, mediastinum and diaphragm,
- Developmental anomalies.

B. Physiology and Biochemistry

- Assessment of pulmonary functions,
- Control of ventilation; pulmonary mechanics,
- Ventilation, pulmonary blood flow, gas exchange and transport,
- Non-respiratory metabolic functions of lung,
- Principles of electrocardiography,
- Inhalation kinetics and its implication in aerosol therapy, and sputum induction etc.,
- Acid-base and electrolyte balance,
- Physiology of sleep and its disorders,
- Pulmonary innervation and reflexes,
- Pulmonary defence mechanisms,
- Principles of exercise physiology and testing,
- Physiological changes in pregnancy, high altitude, aging,
- Physiological basis of pulmonary symptoms.

C. Microbiology

- Mycobacterium tuberculosis and other mycobacteria,
- Bacteria causing pulmonary diseases,
- Atypical organisms and respiratory tract infections,
- Anaerobes in pleuropulmonary infections,
- Laboratory diagnosis of non-tubercular infections of respiratory tract,
- Laboratory diagnosis of TB including staining, culture and drug sensitivity testing,
- Virulence and pathogenecity of mycobacteria,
- Respiratory viruses: Viral diseases of the respiratory system and diagnostic methods Respiratory fungi: **(i)** Classification of fungal diseases of lung: candidiasis, Actinomycosis, Nacardiosis, Aspergillosis, Blastomycosis etc**. (ii)** Laboratory diagnostic procedures in pulmonary mycosis,

- Opportunistic infections in the immuno-ompromised individuals,
- HIV and AIDS. Virological aspects, immuno-pathogenesis, diagnosis,
- Parasitic lung diseases.

D. Pathology

- Acute and chronic inflammation: Pathogenetic mechanisms in pulmonary diseases,
- Pathology aspects of Tuberculosis,
- Pathology aspects of Pneumonias and bronchopulmonary suppuration,
- Chronic bronchitis and emphysema, asthma, other airway diseases,
- Occupational lung diseases including Pneumoconiosis,
- Interstitial lung diseases including sarcoidosis, connective tissue diseases, pulmonary vasculitis syndromes, pulmonary eosinphilias,
- Tumours of the lung, mediastinum and pleura.

E. Epidemiology

- Epidemiological terms and their definitions,
- Epidemiological methods,
- Epidemiology of tuberculosis, pneumoconiosis, asthma, lung cancer, COPD and other pulmonary diseases,
- National Tuberculosis Control Programme and RNTCP; Epidemiological aspects of BCG,
- Epidemiological aspects of pollution-related pulmonary diseases,
- Research methodology, statistics and study designs.

F. Allergy and Immunology

- Various mechanisms of hypersensitivity reactions seen in pulmonary diseases,
- Diagnostic tests in allergic diseases of lung - in vitro and in vivo tests, bronchial provocation test,
- Immunology of tuberculosis, Sarcoidosis and other diseases with an immunological basis of pathogenesis.

G. Pharmacology

- Pharmacology of antimicrobial drugs,
- Pharmacology of antitubercular drugs,
- Pharmacology of antineoplastic and immunosuppressant drugs,
- Bronchodilator and anti-inflammatory drugs used in pulmonary diseases,
- Drugs used in viral, fungal and parasitic infections,
- Other drugs pharmacokinetics and drugs interaction of commonly used drugs in pulmonary diseases,
- Pharmacovigilance

PART-II (60 Marks)

1. **Clinical Pulmonary Medicine**

A. Infections

i. Tuberculosis

- Aetiopathogenesis,
- Diagnostic methods,
- Differential diagnosis,
- Management of pulmonary tuberculosis; RNTCP, DOTS, and DOTS-Plus; International Standards of TB Care,
- Complications in tuberculosis,
- Tuberculosis in children,
- Geriatric tuberculosis,
- Pleural and pericardial effusion and empyema,
- Mycobacteria other than tuberculosis,
- Extrapulmonary tuberculosis,
- HIV and TB; interactions of antitubercular drugs with antiretrovirals,
- Diabetes mellitus and tuberculosis,
- Management of MDR and XDR tuberculosis.

ii. Non-tuberculous infections of the lungs

- Approach to a patient with pulmonary infection,
- Community-acquired pneumonia,
- Hospital-associated pneumonia, ventilator-associated pneumonia,
- Unusual and atypical pneumonias including bacterial, viral, fungal and parasitic and ricketsial, anerobic,
- Bronchiectasis, lung abscess and other pulmonary suppurations,
- Acquired immunodeficiency syndrome and opportunistic infections in immuno-compromised host,
- Principles governing use of antibiotics in pulmonary infections,
- Other pneumonias and parasitic infections, Zoonosis.

B. Non-infectious Lung Diseases

iii. Immunological disorders

- Immune defence mechanisms of the lung,
- Sarcoidosis,
- Hypersensitivity pneumonitis and lung involvement,
- Eosinophilic pneumonias and tropical eosinophilia,
- Pulmonary vasculitides,
- Connective tissue diseases involving the respiratory system,
- Interstitial lung disease of other etiologies,
- Reactions of the interstitial space to injury, drugs,
- Occupational and environmental pulmonary diseases.

iv. Other non-infectious disorders of the lungs and airways

- Aspiration and inhalational (non-occupational) diseases of the lung,
- Drug induced pulmonary diseases,
- Bullous lung disease,
- Uncommon pulmonary diseases (metabolic, immunological, unknown etiology), pulmonary haemorrhagic syndromes,
- Other pulmonary diseases of unknown etiology including PLCH, LAM,• PAP, alveolar microlithiasis,
- Cystic fibrosis and disorders of ciliary motility,
- Obesity-related pulmonary disorders,
- Upper airways obstruction syndromes,
- Occupational lung diseases and pneumoconiosis,
- Air-pollution induced diseases, toxic lung and other inhalational injuries,
- Health hazards of smoking,
- Drug-induced lung diseases.

v. Pulmonary Circulatory disorders

- Pulmonary hypertension and cor pulmonale,
- Pulmonary edema,
- Pulmonary thromboembolic diseases and infarction,
- Cardiac problems in a pulmonary patient and pulmonary complications produced by cardiac diseases.

vi. Obstructive diseases of the lungs

- Asthma including allergic bronchopulmonary aspergillosis, specific allergen immunotherapy and immunomodulation,
- Chronic obstructive lung disease and diseases of small airways,
- Special aspects of management including Long term oxygen therapy, Inhalation therapy and Pulmonary rehabilitation.

vii. Tumors of the lungs

- Comprehensive knowledge of neoplastic and non-neoplastic diseases of lung including epidemiology, natural history, staging, and principles of treatment (medical, surgical, and radiation),
- Solitary pulmonary nodule.

viii. Diseases of the mediastinum

- Non-neoplastic disorders,
- Benign and malignant (primary and secondary) neoplasms and cysts,

ix. Disorders of the pleura

- Pleural dynamics and effusions,
- Non-neoplastic and neoplastic pleural diseases,
- Pneumothorax,
- Pyothorax and broncho-pleural fistula,
- Fibrothorax.

x. Critical Care Pulmonary Medicine

- Management of emergency problems of different pulmonary diseases,
- Adult respiratory distress syndrome,
- Respiratory failure in the patient with obstructive airway disease,
- Respiratory failure in other pulmonary diseases,
- Management of sepsis,
- Respiratory and haemodynamic monitoring in acute respiratory failure,
- Non-invasive and Mechanical ventilation,
- Principles of critical care, diagnosis and management of complications; severity of illness scoring systems,
- Ethical and end-of-life issues in critical care.

xi. Extrapulmonary manifestations of pulmonary diseases.

xii. Sleep-related pulmonary diseases

- Polysomnography,
- Sleep apneas,
- Other sleep-disordered breathing syndromes.

xiii. Miscellaneous aspects

- Diseases of the diaphragm,
- Disorders of chest wall,
- Obesity-related pulmonary disorders,
- Oxygen therapy,
- End-of-life care,
- Aerospace Medicine,
- Pulmonary problems related to special environments (high altitude, diving, miners),
- Assessment of quality of life using questionnaires,
- Health impacts of global warming.

xiv. Preventive Pulmonology

- Principles of smoking cessation and smoking cessation strategies,
- Cardiopulmonary rehabilitation,
- Preventive aspects of pulmonary diseases,
- Vaccination in pulmonary diseases.

2. Surgical aspects of Pulmonary Medicine

- Pre- and post-operative evaluation and management of thoracic surgical patients,
- Chest trauma/trauma related lung dysfunction,
- Lung transplantation.