CONTACT PERIODS :4 (LECTURE) PER WEEK

DURATION OF EXAM : 3 HOURS

EXAM MARKS : 100

PROGRESSIVE MARKS : 50

Objective:

To develop the knowledge and skills required for understanding the mechanical services in buildings and their integration with architectural design.

Outline:

Part – A

Mechanical/Artificial Ventilation –

Need for mechanical ventilation in buildings. Rate of ventilation for different occupancies. Methods and equipment employed for mechanical ventilation in buildings.

Air Conditioning –

Definition, advantages and disadvantages, brief introduction to psychrometric process, air-cycle and refrigeration cycle. Summer and winter air-conditioning, calculation of air-contitioning loads, Zoning: purpose and advantages. Air-distribution systems: Ducts and duct systems. Air-outlets

Air-conditioning methods and equipment: window units, split units and central Air-conditioning systems. Location of air-conditioning equipment in buildings. Architectural requirement of various equipment.

Residential and commercial air-conditioning, energy conservation techniques. Introduction to the concept of ‘Clean Room’ and its architectural requirements.

Part – B

Elevators (Lifts) and escalators –

Brief history-types of Elevators like traction, Hydraulic etc., Double-decker, sky lobby, lift lobby, lift interiors etc., Definition and components

Elevatoring a building: environmental considerations i.e., location in building, serving floors, grouping, size, shape of passenger car, door arrangement etc.,

Service requirements: Quality of service, quantity of service, time, passenger handling capacity, space and physical requirements, machine room spaces and their typical layout

Escalators – Definition, Application. Location and arrangement in buildings. Space requirement, Escalators V/S Elevators, Conveyor belts-movement of passengers and goods

Part - C

Causes of fire, reasons for loss of life due to fire, development of fire, fire load, fire hazards, grading of structural elements due to fire as per NBC. Classification of building types as per NBC

Brief description of characteristics of combustible and non-combustible materials in case of fire

Concepts in passive fire protection and control – including design of escape routes, pressurization and compartmentation, etc.,

Active fire control using portable extinguishers. Basic concepts in fixed fire fighting installations. Automatic fire detection and alarm systems

Rules for fire protection and fire fighting requirements for High-rise buildings in India.

References:

1) ‘Principles of Refrigeration’ by Roy J Dosat

2) ‘Air Conditioning and Refrigeration Data Hand book’ by Manohar Prasad

3) ‘Refrigeration and Air Conditioning’ by Don Kundwar