First Lecture

1- Revision of third year in sanitary services covering (first semester)

a- Water supply
   i. - Cold Water
   ii. - Hot Water
   iii. - Installations + Equipment

b- Drainage
   i. - Single Pipe System
   ii. - Two Pipe System
   iii. - Cesspool + Septic Tank
   iv. - Invert + Cover Levels of M.H.
   v. - Regulations & standards

Second Lecture

2- Revision of third year in Mechanical Services (2nd Semester) covering:

a- A.c. + Ventilation requirements

b- Principle of Heat Pump
c- Equipments and Major Parts
   (Cooling Towers + Chillers..etc.)
d- A.C. Systems:
   i. - Fan Coil
   ii. - Air Handling
   iii. - Ducts
Third Lecture: LIFTS (ELEVATORS)

- Introduction to circulation requirements using associate charts, sausage diagrams, Tree graphs, network planning, simple ring diagrams.

Mechanical Conveyors

a- purpose of Mechanical Conveyors
   - To transport people
   - To transport goods
   - Decorative

- Location of Conveyors
   - According to functional needs
   - According to design needs
   - According to regulatory needs

- Types of Mechanical Conveyors:

1- Lifts (elevators) - Hydraulic
   Electro-mechanical

2- Escalators – (800 mm width could handle 7000 Person/hour.
   limited speed about 0.6 m/sec.
   Require space for Motor room.
   Inclination 30° - 35°.

3- Paternosters – can carry 650 person/hour.
   Speed around 0.35 m/sec.
   Can carry limited no. of persons.
The lecture begins with a discussion on different types of elevators. It introduces Travelators—regular speed elevators typically used for relatively long distances (100 m and over, as in airports, stations, etc.). These require changing space if branched circulation is needed, and additional space for equipment should be provided.

- Pneumatic (Tubes) elevators, usually found in industry, are not recommended for transporting living beings and are now rarely used.

Doors are calculated usually per person per unit width (533 p./1 m.), with this figure higher in certain traffic densities (e.g., 1418 p/hr. in departmental stores and 2533 p/hr. in railways and metro stations).

Door Types include:
- Single Swing
- Double Swing
- Sliding (Single Or Double)
- Folding (concertina) Door
- Other types (revolving, up and over, ticket gates, etc.)

The lecture concludes with a summary of key concepts:

**Fourth Lecture**

- Lift Home Concept and its affect on operational systems.
- Lift Operation:
  - Every Floor stop
ii. Desirable floors stop
iii. Controlled floor stop (odd-even)
iv. Transfer Lifts (High Rise Building)
v. Service lifts
vi. Firemen's Lifts

- Growing of Lifts
  i. Side by Side (1 to 4 max.)
  ii. Face to Face (4 to 8 max.)
  iii. Two groups (8 and over)

- Principle of Mechanical conveyors
  i. Hoist – for vertical movements as in lifts and paternoster used in multi Strong building.
  ii. Belt – for Horizontal and inclined moment as in escalators and travelators (small inclined 5°)
  iii. Cable – for Horizontal and in dined movement as in Telephrique. May require intermediary support to cable.
  iv. Chain – As in iii above but the chain is moving with fixed platforms Or containers as in paternosters and factory conveyors.
  v. Tube – move in any direction and using pneumatic principle (vacuum).

- Major Elements of Lift Zone:
  i. Pit
  ii. Lift Shaft
  iii. Lift Car
  iv. Door Sets
  v. Motor+ Equipment Room
  vi. Control and call system.

- Control Types Of Lifts
  i. Operator
  ii. Automatic
  iii. Collective (stops at each floor)
  iv. Group collective (more than 1 lift, up to 4 lifts)
  v. Programmed – Return to lift Home.

- Buffers Types:
  i. Absorbent Materials (Cork, Rubber, Foamed
Polyurethane…etc.) limited height, very slow low rise, building.

ii. Spring – Low speed lifts, limited height of buildings

iii. Hydraulic (oil loaded) – for faster speeds.

- Depth of pits – varies with lift speed and manufacture's requirements.
- Speeds- about 0.5 →1 m/sec. lift speed for limited height.
  2.5 m/sec. →5 m./sec. for building up to 8 floors.
  6 → 7 m./sec. considered fast speed
  7 → higher, specially considered, relevant to users health.