UNIT - I

BASICS OF MAINTENANCE & REPAIRS
Explain the necessity of Maintenance and Repair of civil structures

Types of structures

- Buildings
  - Religious
  - Residential
  - Commercial
  - Industrial
- Infrastructure
  - Roads
  - Bridges
  - Dams
  - Tunnel
Explain the necessity of Maintenance and Repairs to civil structures

Objectives:

• Prevent damages and decay
  ➢ Perishable material
  ➢ Environmental attack

• Good appearance and working condition
  ➢ Mental health of occupants
  ➢ Positive environment

• Serviceability
  ➢ Preventive maintenance
  ➢ Maintainability

• Restorability
  ➢ Reduced cost of repairs
  ➢ Economic viability of repairs

• Safety - At any cost

• Health of occupants
  ➢ Biological growth
  ➢ Pests
Why do structures deteriorate?

- Poor design
- Poor detailing
- Poor specifications
- Poor construction
- Poor maintenance
- Calamity
  - Natural
    - Flood
    - Earthquake
    - Cyclone
  - Man made
    - Fire
    - Blast
    - Accident
    - Structural modifications

- Architectural design
- Structural design
- Services design
- Lack of knowledge of material behaviour
- Use of unproven materials

Explain the necessity of Maintenance and Repair of civil structures

- Inadequate detailing
- Incorrect detailing
- Poor quality
- Pilferage
- Corruption
- Lack of knowledge of material behaviour
- Use of unproven materials
Know the factors that influence maintenance of given structure with justification

• Ignorance
• Lack of knowledge of maintenance
• Inaccessibility
  ➢ Terrace
  ➢ Sloping roofs
  ➢ Ducts
  ➢ Above false ceilings
  ➢ Restricted areas

• Lack of resources
  ➢ Funds
  ➢ Manpower
  ➢ Expertise
  ➢ Material

• Environment
• Limited shut down period
• Rent control act
• Importance of the structure
Explain the concept of Retrofitting, Re-Strengthening, Rehabilitation & Restoration

- **Retrofitting** - The process of strengthening of a structure along with structural system so as to comply with all relevant codal provisions that are in force, during that period.  
  *(Providing something with a component or feature not fitted in construction)*

- **Re-strengthening** - The process of increasing load resistance capacity of a structure or portion.

- **Rehabilitation** - The process of repairing the structure to meet desired useful condition. Upgradation of structure to meet present need. *(Mostly for abandoned structures)*

- **Restoration** - The process of re-establishing the materials, form and appearance of a structure.

- **Repairs** - The process of replacement of damaged part/components of a structure with new, of similar size, quality & number.
Know the periodical maintenance and its manual, monsoon maintenance, maintenance history sheet

• Different components of a structure have different life cycles.
• Periodic maintenance will depend on the type of structure & its construction technique.
• Each structure shall have a different maintenance manual & the same shall be dynamic.
• Pre - monsoon maintenance
  - Cleaning up of terrace
  - Crack filling
  - Protection shed
  - Maintenance history sheet