

AMS23 EARTHQUAKE ANALYSIS & DESIGN OF STRUCTURES

UNIT-1 INTRODUCTION TO DYNAMIC

- 1.1 Loads Static Load v/s Dynamic Load,
- 1.2 Types of Dynamic forces, Force Control and Displacement Control

UNIT-2 BASICS OF SEISMOLOGY

- 2.1 Earth and its interior, Plate Tectonics, Convection Currents, The Earth quake, Inter Plate Earthquake (Convergent Boundaries, Divergent Boundaries and Transform Boundaries),
- 2.2 Intra Plate Earthquake (Faults and Types of Faults), Seismic Waves,
- 2.3 Basic Terminology, Measuring Units and Instruments

UNIT-3 BEHAVIOR OF STRUCTURES DURING EARTHQUAKE AND EARTHQUAKE RESISTANT FEATURES OF STRUCTURE

- 3.1 a) Inertia forces in structures
- 3.2 b) Behavior of Brick Masonry Structures: Behavior of Brick Masonry Walls, Box Action, Different types of Bands
- 3.3 c) Behavior of Stone Masonry Structures: Behavior of Stone Masonry Walls, Earthquake Resistant Features of Stone Masonry Structures
- 3.4 d) Behavior of RC Structures: Load Transfer Path, Strength Hierarchy, Reversal of Stresses, Importance of Beam Column Joints, Importance of Stiffness and Ductility (Capacity Design Concept) in Structures, Effect of Short Column,
- 3.5 Effect of Soft Storey, Improper Detailing, Effect of Masonry Infill Walls, Effect of Eccentricity, Effect of Pounding, Effect of Floating Columns,
- 3.6 Effect of Flexibility and Effects of Setbacks, Earthquake Resistant Features of RC Structures
- 3.7 e) Earthquake Design Philosophy

UNIT-4 FUNDAMENTALS OF EARTHQUAKE VIBRATIONS OF STRUCTURES

- 4.1 Equation of Motion (By Newton's Law and By D'Alembert's Principle),
- 4.2 Degrees of Freedom, Simplified Single Degree of Freedom, Mathematical Modeling,
- 4.3 Equation of Motion for Free Vibration for Damped and Un damped System (Single Degree of Freedom System),
- 4.4 Equation of Motion for Forced Vibration for Damped and Un damped System(Single Degree of Freedom System), Logarithmic Decrement

UNIT-5 EARTHQUAKE LOAD ANALYSIS ON STRUCTURES

- 5.1 Introduction to methods of Earthquake Load Analysis (Linear Static, Linear Dynamic, Non Linear Static, Non Linear Dynamic)
- 5.2 Analysis of Structure by Linear Static Method (Seismic Coefficient Method)
- 5.3 Analysis of Structure by Linear Dynamic Method (Random Response Method)

Reference Books:

1. Earthquake Resistant Design of Structures By Pankaj Agarwal & Manish Shrikhande, PHI Publications
2. Manish Shrikhande & Pankaj Agrawal; Earthquake Resistant Design of Structures, PHI Publication, New Delhi
3. S. K. Duggal; Earthquake Resistance Design of Structures; Oxford University Press, New Delhi

