

AMC- 16 : DESIGN OF STEEL STRUCTURES

1. General Construction

Introduction, Advantages of steel as a structural material, Disadvantages of steel as a structural material, Structural steel, Stress-strain curve for mild steel, Rolled steel sections, Loads, Permissible stresses, Working stresses, Factor of safety, Minimum thickness of structural members, Design methods.

2. Structural Fasteners

Riveting, Bolted joints, Types of riveted and bolted joints, Definition, Failure of a riveted joint, Strength of riveted/bolted joint, Assumptions in the theory of riveted joints, Efficiency of a joint, Design of riveted joints for axially loaded members, Welded joints, Advantages of welded joints, Disadvantages of welded joints, Types of welds and their symbols, Design of fillet welds, Design of butt weld, Design of plug and slot welds.

3. Compression Members

Introduction, Effective length, Slenderness ratio, Column design formula, Types of sections, Assumptions, Design of axially loaded compression members, Built-up columns (latticed columns), Lacing, Batten, Compression members composed of two components back-to-back, Encased column, Eccentrically loaded columns, Solved examples.

4. Tension Members

Introduction, Net sectional area, Permissible stress, Design of axially loaded tension member, Lug angle, Tension splice.

5. Column Bases & Footings

Introduction, Types of column bases, Slab base, Gusset base, Welded column bases, Design of hold-down angles and base plates, Grillage footing, Solved examples.

6. Beams

Introduction, Design procedure, Built-up beams, Plate thickness, Simple beam end connections.

7. Industrial Buildings

Introduction, Planning, Structural framing, Types, Roof and side coverings, Elements of an industrial building, Design steps of industrial building, Solved examples.

8. Beams Column

Introduction, Eccentricity of load, Eccentrically loaded base plates.

9. Elementary Plastic Analysis & Design

Introduction, Idealized stress-strain curve for mild steel, Scope of plastic analysis, Ultimate load carrying capacity of tension members, Ultimate load carrying capacity of compression members, Flexural members, Shape factor, Load factor, Mechanism, Plastic collapse, Conditions in plastic analysis, Principle of virtual work, Theorems of plastic analysis, Methods of analysis, Cancellation of hinge in the combined mechanism [beam + panel], Design, Limitations of plastic analysis, Plastic design vs elastic design, Solved examples.

10. PLATE GIRDER

Introduction, Economical depth and self-weight of plate girder, Design of web, Design of flanges, Curtailment of flange plates, Riveted connections, Web stiffeners, Web splice, Flange splice.
