ARCH 614. Study Guide for Quiz 4

This guide is not providing “answers” for the conceptual questions. It is a list of topical concepts and their application you should be familiar with. It is an aid to help prepare for the quiz.

Covers material of Lectures 9, 10, 11 & 12

- Neutral axis, section modulus, $Q$, extreme fiber
- Maximum shear stress (& location along length and in cross section)
- Maximum shear stress by beam shape (proper equations)
- Shear flow and shear center
- Connected area
- Nail capacity and pitch for resisting longitudinal shear
- Statically Determinate vs. Indeterminate
- Restrained
- Continuous
- Inflection point
- Moment redistribution for statically indeterminate beams
- Theorem of Three Moments
- Continuous beams with pins
- Use of Beam Diagrams and Formulas
- Pinned arches and frames
- Funicular
- Rigid vs. non-rigid pinned frames
- Rigid frame behavior
- Free Body Diagram rule for force at a pin of a frame
- Connection types and load/moment transfer
- Types and purpose of bracing
- Stability
- Buckling
- Slenderness
- Critical Buckling and Euler’s Formula
- Effective length, $K$ & bracing
- Beam-Columns
- Combined bending and compression – interaction
- $P$-$\Delta$ effect
- Eccentricity
- Relative joint stiffness for determining effective length ($\psi$)
- Lateral buckling (and bracing)
- Lateral torsional buckling
- Allowable Stress Design
- Load and Resistance Factor Design
- Working loads
- Factored loads
- Resistance Factors
- “Design” values vs. “Capacity”
- Factor of Safety
- Density of materials and relation to weight
- Load types (and directions) (like $D$, $L$, $S$ ...)
- Load combinations
- Minimum Design Loads & Requirements
- Serviceability and limits
- Design vs. analysis
- Actions vs. reactions
- Load tracing & tributary width (vs. area)