Specialisation in Structural Engineering

final exam questions

Steel Buildings BMEEOHSA-A1 and Reinforced Concrete Buildings BMEEOHSA-A2

1. Structural systems of low-rise industrial buildings, load transfer, design principles, loads: a) reinforced concrete halls; b) steel industrial halls and space structures; c) timber halls.
2. Secondary members of steel industrial buildings (sheathing, purlins, wall girts): types and design aspects.
3. Floor systems, configurations, behaviour, load transfer and design: a) reinforced concrete slab systems (elastic and plastic design); b) reinforced concrete slab directly supported by columns, prestressed concrete floors; c) composite floor system, shear connectors.
4. Structural systems of multi-storey buildings, load transfer, configurations, analysis and design: a) gravity structural systems; b) lateral load-resisting systems, bracing concepts, design
5. Multi-storey RC buildings with coupled walls or wall-frame dual systems, core systems, behaviour, analysis and design
6. Principles of prestressing, materials and components, prestressing technologies and their specialties, losses of prestress, configuration of prestressed floor systems.
7. Masonry wall systems: reinforced and non-reinforced walls, configuration, behaviour, strength and stability checks, behaviour and design of masonry infilled reinforced concrete frames.
8. Analysis and design of steel structures: a) components of numerical model, models for conceptional and detailed design, strength verifications; b) stability failure modes, design concepts and approaches for stability verifications.
9. Connections of structural members, types, analysis and design: a) steel connections, component method, continuous and simple connections; b) local load introduction in RC members, partially loaded areas, arches, cantilever, stairs.
10. Structures subjected to extreme effects: a) seismic effect, design principles, lateral force method, modal spectrum analysis; b) fire effect, safety concepts, design of steel structures according to Eurocode, protection.

Building Construction Methodology BMEEOEMA-A1

1. Compare the main characteristics of the two basic load bearing structures (short main beam and long main beam systems)!
2. What kind of materials can be used for large-span structures? Specify the structural characteristics of these load bearing structures (span range, frame distance, supporting structures, shapes and size of structures, etc.)!

Engineering Works BMEEOHSA-B3

1. Structural systems for underground garages. Static performance and design of base plates and floor slabs. Tools for supporting the working pit by cut-off walls, anchoring and strutting.
2. Engineering works for water treatment and water storage, static performance of circular cylinder and rotation symmetric tanks, strength and design, waterproofing (concrete, structure).
3. Structural formation of water towers tower-like structures. Specific methods for their design and construction, loads and effects, methods of vibration protection.