

Branch of Structural Engineering – Major of Buildings

Final exam questions

Steel Buildings – BMEEOHSASA1

1. Main load-bearing structural systems of steel low-rise industrial buildings, design principles; structural configurations of bracing systems.
2. Secondary members of steel industrial buildings (sheathing, purlins, wall girts): types and design aspects.
3. Principles of computer aided design methods applicable for steel building structures.
4. Continuous (moment-resisting) beam-to-beam and beam-to-column end-plate connections of steel frames, and column base connections of steel frames: detailing, design concept/principles.
5. Concept and principles of seismic design of steel buildings.

Reinforced Concrete Buildings – BMEEOHSASA2

6. Structural systems of reinforced concrete low-rise industrial buildings; loads; bracing systems.
7. Multi-storey reinforced concrete buildings: frame systems and configurations, floor systems and configurations; loads on multi-storey buildings; design principles.
8. Reinforced concrete slab directly supported by columns: principles of elastic and plastic design; prestressed concrete floor systems and their design principles.
9. Bracing systems of multi-storey reinforced concrete buildings; behaviour of reinforced concrete frames with infill masonry; design aspects.
10. Multi-storey reinforced concrete buildings composed of coupled shear wall system; buildings with frame – shear wall dual system: behaviour and analysis.

Timber Structures – BMEEOHSASA3

11. Strength and stability checking of sawn and glulam timber structures subjected to pure and combined internal forces.
12. Design and structural detailing of connections of timber structures with shear connectors (bolted, nailed) and other metallic connectors (angle, nail-plate, split-ring).
13. Structural configurations, topology and detailing of long-span timber structural systems (girders, lattice girders, arches and frames).

Strengthening of Structures – BMEEOHSASA4

14. Diagnostic and qualification methods for existing masonry, reinforced concrete, steel and timber floor systems; models for structural analysis and detailing for possible strengthening methods.
15. Diagnostic and qualification methods for existing masonry, reinforced concrete, steel and timber vertical load-bearing structural elements (columns, walls and stairs); static models and detailing for possible strengthening methods.

Composite Buildings – BMEEOHSASA5

16. Structural arrangement of composite buildings (girders, floor systems, columns, shear connectors) and behaviour aspects (creep, shrinkage, concrete cracking).
17. Plastic design of continuous composite beams; analysis of internal forces; cross-section and connection resistance; partial composite action.

Industrial and Agricultural Building Design – BMEEOHSASA6

18. Comparison of precast reinforced concrete, steel and mixed structural systems of industrial and agricultural buildings; historical evolution; module coordination; fitting to raster; connection detailing; typical structural forming.
19. Silicate-base prefabricated roof and wall-sheathing systems of industrial and agricultural buildings; detailing; positioning of gate-, door- and window openings, natural illuminations.
20. Light-gauge layered or panelled roof- and wall-sheathing systems of industrial and agricultural buildings; detailing; positioning of gate-, door- and window openings, natural illuminations.