

Questions of theory for the tests of Fundamentals of Structures 2014

1st test:

1. By what kind of actions are originated loads and effects acting on load-bearing structures?
2. What does temperature effect cause, and how can it be determined?
3. How does Newton's 2nd law define forces?
4. How can self-weight be determined?
5. Give examples for a 1kN force!
6. What does the vector character of forces mean?
7. What data do define a concentrated force?
8. How can You determine the moment of a force with respect to one point?
9. What does force scale mean?
10. How can you add up two forces by geometrical method?
11. How can you add up two forces by analytical method?
12. What does a couple mean?
13. Give classification of loads according to mode of actuation!
14. Give some examples for dynamic loads!
15. How can be loads classified according to duration of application?
16. How can be loads classified according to distribution?
17. What is the difference between characteristic and design value of loads?
18. What does specific weight mean?
19. Which loads are called meteorological loads?
20. What do live loads depending from?
21. What is the architectural style of the central building (the K building) of the Budapest Technical University and how old is it ?
22. Give the major structural materials of the K building (foundation, walls, roof structure, floor structures)!
23. What important dimensions of the K building are familiar to you? (Length, storey height, spans etc.)
24. Give the fundamental requirements of the built environment!
25. What kind of requirements are in connection with the functionality of buildings?
26. In what respects is safety required in connection with buildings?
27. Give some aspects of aesthetical appearance!
28. What does economic character mean in connection with construction of buildings?
29. What is the major function of load-bearing structures of buildings?
30. What does stress mean?
31. What does strength mean?
32. Give the major structural requirements of structural materials!
33. What are non-structural requirements of structural materials?
34. What structural materials do you know?
35. What does deformability mean and what is its unit?
36. What does the f_k/γ ratio mean? What is its unit?
37. What does strain mean and what is its unit?

38. Give a stress-strain diagram and characterize it? Give also the material of which it is characteristic!
39. Give the formula of the Hook's law and describe its meaning!
40. Characterize the mechanical behaviour of timber!
41. Characterize the mechanical behaviour of steel!
42. Characterize the mechanical behaviour of concrete!
43. Draw the characteristic form of the density function of strength distribution!
44. What is scatter?
45. How do you determine the mean value of measurement data?
46. What is the difference between mean value and characteristic value of strengths?
47. What is the difference between characteristic and design value of a strength?

2nd test:

48. Why do we need the static model of structures and what are the main components of the static model?
49. What is a linear member of a structure!
50. What is a surface member of a structure!
51. Characterize a hinged support of a planar structure!
52. Characterize a restrained (or clamped) support of a planar structure!
53. Draw two static models and give the name of them!
54. What does it mean „internal hinge„? (How is it indicated in the static model, and how can its behaviour be characterized?)
55. Draw the static model of a multi-storey double-bay rigid frame!
56. How can structures be classified by their span?
57. From what points of view can structures be classified?
58. What are the fundamental laws of structural analysis?
59. What is given by the material law?
60. Explain the meaning of the law of continuity!
61. How many independent equilibrium conditions can be formulated in the plane?
62. Why do we have to determine the responses of structures?
63. Enumerate the different responses of structures?
64. Give two examples for limitation of responses of structures (kind of the response and reason of limiting should be given)!
65. Name the phases of life of an architectural object (a house)!
66. What do you know about the general development project (GDP)?
67. What kind of projects are authorized by the local building authority?
68. What kind of architectural projects of a building are made, and try to give the characteristic scale of each of these projects!
69. What is the difference between the client and the general manager?
70. What is a tender, who are participating in it?
71. What is the task of the technical supervisor of a building under construction?
72. What is the difference between urban designer and architect?

73. Name all participants who have to do anything with the design, realization, functioning and demolition of a building!
74. Classify the general design requirements of a building according to whom they are the most important!
75. Name at least 5 potential subcontractors of a building construction!
76. Name at least 3 engineering professions who can participate in design of a building together with the architect!
77. What do public utilities mean? Name them!
78. In what respects can public interest be important in connection with design, construction, operation and demolition of buildings! (If You can give one example for each phase, You will get +5 points!)
79. In Your opinion of who's interest should represent the architect?

After 2nd test

80. What kinds of documentations of a building do You know? (Give the name of at least four)
81. What is the difference between architectural and structural plan?
82. What is the content of the building permission documentation?
83. Give three important discoveries in connection with the development of statics!
84. Explain the meaning of stress and strain!