

**BACHELOR OF ARCHITECTURE EXAMINATION, 2019**  
**(B. Arch. 2nd year 2nd Semester)**

**SUBJECT: STRUCTURE FOR ARCHITECTS**

Time : Three hours

Full Marks: 100

Instructions: Answer for 100 marks. Use sketches wherever necessary

01. Describe what you understand about 'Equilibrium of Structures'. Describe 'Stability of structures' in light of translational and rotational equilibrium of structures.  
  
Describe optimization in applied to structural analysis and design considerations in light of (a) Strength, (b) Functionality, (c) Economy and (d) Aesthetics. 25
02. Using appropriate sketches, describe the basic principles of 'Post & Lintel' structures and 'Arcuated' structures  
Describe 'Portals' and 'Vierendeel trusses'  
Describe the principles of working of 'Pre-tensioned' and 'Post-tensioned' structures 25
03. Discuss the properties of materials in light of selection of the same for use in different types of structures and parts thereof in architecture. 25
04. Describe the structural behavior of 'Grids', 'Plates', 'Folded Plates' and 'Space Frames' as different types of structural systems used in the building or other constructions. Also cite comparison of each of these structural prototypes with its natural typologies. 25
05. Using suitable sketches of different typologies, describe in detail the structural behavior of 'Thin Shells' and 'Reticulated Domes' 25
06. Discuss the 'Membrane' or 'Tensile Structures' with reference to the ones found in Nature. Describing a few appropriate examples of tensile structures, furnish construction details at various points of such structures. 25
07. Write an essay on 'Structural Aesthetics'. Describe how an appropriate structural system is related to structural aesthetics.  
Describe the principal causes of structural failures. 25
08. Write short notes on (any five) (5 X 5) = 25
  - (i) Wind Bracing
  - (ii) Vierendeel Girder
  - (iii) Post-tensioned beams
  - (iv) Shells and Vaults
  - (v) Shear Walls
  - (vi) Cantilever
  - (vii) Synclastic and Anti-clastic shapes
  - (viii) Fazlur Rahman Khan's contribution in Structural innovations
  - (ix) Gusset and Splice plate in steel structure
  - (x) Isostatic lines in a plate