

PARUL UNIVERSITY
FACULTY OF ARCHITECTURE & PLANNING
B.Arch. Winter 2019-20 Examination

Semester: 7

Subject Code: 01101404

Subject Name: Advance Structural Design & Analysis

Date: 11/12/2019

Time: 2:00 pm to 4:00 pm

Total Marks: 50

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever required.
4. Draw suitable sketches wherever required.

Q.1 Design a Structure for an Open Public Plaza accommodating 100-150 persons in a Volume of 20 x 20 X 20 (10)
 M. The Structure should be made up from any one of the following structural system:

1. Form Active Structure
2. Pneumatic Structure
3. Space Truss
4. Shell Structure
5. Cable Structure

Showing the basic Load Accumulation from Top to bottom of the Structure with respect to the relevant material used for Construction. (Scale 1:20). Also demonstrate Any 02 Details at Junction (Scale 1:10), Label the Nomenclature of the Construction Elements and its Dimensions, Material Hatch, Dead Load (DL) Generated, Proportion / Grade of Materials used.

Q.2 Attempt any five out of the following six: (suitable sketches) (20)

- 1) Define the following:
 - 1) Continuity
 - 2) Retaining wall
 - 3) Torsion
 - 4) Redundancy
- 2) Differentiate any one of the following:
 - a) Structure Design – Structure analysis
 - b) Long Span Structure – Highrise Structure
- 3) Filling the blanks:
 - a) _____ per m³ dead load is generated by Brick.
 - b) _____ % of reduction in imposed load is done for constructing over 10 Floor.
 - c) _____ is the UDL per m² & _____ concentrated load generated by Living and Bed Rooms.
 - d) _____ is the UDL per m² & _____ concentrated load generated by Assembly Buildings.
- 4) Explain the Criteria to be considered for erecting an Aseismic Structure.
- 5) Explain the Structural Principals with respect to Architecture (Conceptual, Experiential and Contextual Ordering of Architecture) with one relevant Example.
- 6) Explain Long Span Structures and State the Limitations of Long Span Structure.

Q.3 Explain the Following with relevant Sketches / Examples: (any Five) (10)

1. Cable Structure & Tent Structure
2. Lateral Force System & P-Delta Effect.
3. Folded Structures & Shell Structure Stress and Strain
4. Form Active Structure & Surface-Active Structure
5. Flat Trusses & Curve Trusses
6. Vector active & System active.

Q.4 Answer the following: (any two) (10)

1. Explain the importance of Structural System since Inception with respect to major historical events.
2. Enlist and Explain the various types of Retaining wall
3. Explain the types of Failures in Structure and its defect in Failure.