

PARUL UNIVERSITY
FACULTY OF ARCHITECTURE & PLANNING
B.Arch. Winter 2018-19 Examination

Semester: 7

Date: 05/12/2018

Subject Code: 01101404

Time: 02:00 pm to 04:00 pm

Subject Name: Advance Structural Design & Systems

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.
5. IS – Code 800: 2007 is permitted.

Q.1 Two plates 120 X 10 mm and 120 X 16 mm are connected by lap joint to resist factored tensile load of 120 KN. Design a lap joint using M 16 bolts of grade 4.6 and grade 410 plates. (10)

Q.2 Attempt any five out of the following: (with relevant sketches) (20)

1) Explain various steel structural members with neat Sketches, which is used for designing a beam-column. Mention the all types steel structure.

2) Enlist and Explain the types of Failures in Various structures.

3) Explain the qualities of Long Span structure along with relevant sketches.

4) Explain the following:

a) Two- Hinge Arch

c) Tensile Structure

b) Pneumatic Structure

d) Cable Structure

5) Define the following:

a) Seismic Load

c) Folded Plates

b) Retaining Wall

d) End of Bolts

6) Brief out the following:

a) Compressive Member

c) Pitch of Bolts

b) Shell Structure

d) Tension Member

Q.3 Explain the following: (any five) (10)

1) Methods for preventing a Collapse in a structure.

2) Force System of any one of the Complex Structural System.

3) Structural system of any one existing building.

4) Types of joint in Steel Structure.

5) Deflection of Beam in a Tension Member.

6) Force system in Tensions, Compression & Tensile Structure.

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

a) Determine the design axial compressive load on column section ISMB 400 @ 61.6 Kg/m having length of 5 m between intersections and pinned at ends. Take $f_y = 250$ MPa.

b) Write the difference between Shell and Pin-joint trusses.

a) Explain the various types steps of tension member design in steel structure.