

**PARUL UNIVERSITY**  
**FACULTY OF ARCHITECTURE**  
**B.Arch./ B.ID., Winter 2018 - 19 Examination**

**Semester: 3****Subject Code: 01101206****Subject Name: Structural Design and Analysis-I****Date: 13/12/2018****Time: 10:00 am to 12:00 pm****Total Marks: 50****Instructions:**

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

- Q.1** Find the reaction of beam: **(10)**
1. a simply support beam having 30KN/m UDL at all over span of 4.6m.
  2. a simply support beam having 40KN point load at center of 4.8m long beam
- Q.2 Explain Briefly: (Attempt any 5)** **(20)**
- a. List and explain the major component of member of R.C.C. building.
  - b. Axis of symmetry and point of symmetry
  - c. Explain Super structure and Sub structure with different components and figures
  - d. State and prove the law of parallelogram theorem.
  - e. Difference between Load bearing structure and frame bearing structure.
  - f. Coplanar forces and non-coplanar forces
- Q.3 Explain the term (Attempt any 5)** **(10)**
- a. Define with the expression parallel axis theorem and perpendicular axis theorem..
  - b. What does “20” stands for in M20? (tick a correct one and explain proper reason)
    - i. Tensile Strength
    - ii. Compressive Strength
    - iii. Quantity of Cement
    - iv. Water Cement Ratio
  - c. UDL and UVL
  - d. Dead load and live load
  - e. Number of coplanar forces passing through one point are. (tick a correct one and explain proper reason)
    - i. Parallel forces
    - ii. Concurrent forces
    - iii. Spatial forces
    - iv. Perpendicular forces
  - f. It is a scalar quality(tick a correct one and explain proper reason)
    - i. Force
    - ii. Mass
    - iii. Moment
    - iv. Couple
- Q.4 Describe Briefly: (Attempt any 2)** **(10)**
- a. Explain type of supports and type of beams in detail with relevant sketches.
  - b. An ISA section, 150 x100 x10, if thickness of web and flanges are 10 mm uniform, determines its centroidal axis.
  - c. Explain the role of Structural Design in the architectural field.