Seat No:_____ **Enrollment No:_____**

PARUL UNIVERSITY

FACULTY OF ARCHITECTURE

B.Arch./ B.ID, Winter 2017-18 Examination

Semester: 3 **Date: 08/12/2017**
Subject Code: 01101206 **Time: 10:00 am to 12:00 pm**
Subject Name: Structural Design and Analysis-1 **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)**

a. A simply support beam having 20KN/m UDL at all over span of 3.6m.

b. A simply support beam having 30KN point load at center of 2.8m long beam.

Q.2 Answer Briefly: (Attempt any 5) **(20)**

a. Define force. Explain different system of forces.

b. Explain types of loading on beams.

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. Explain different types of foundations in detail with neat sketch.

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. Free body diagram

d. 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.