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

PARUL UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

M.Tech. Winter 2018 - 19 Examination

Semester: 1 **Date: 12/12/2018**
Subject Code: 203209132 **Time: 10:30 am to 01:00 pm**
Subject Name: Theory of Structural stability **Total Marks: 60**

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 A) Define stability and types of stability in brief with example. **(05)**

B) Explain Effect of axial load on bending stiffness for slope – deflection equation. **(05)**

C) Explain stress – strain behavior of concrete. **(05)**

Q.2 **Answer the following questions**. (Attempt any three) (Each five mark) **(15)**
A) Enlist methods of stability analysis and explain any one method in brief.

B) Derive an expression for crippling load when one end of column is fixed and the other end is hinged.

C) Derive an expression for deflection in beam with concentrated central load.

D) Elaborate differential equation of plate buckling: Linear theory.

Q.3 A) Derive an expression for crippling load when both ends of column is fixed. **(07)**

B) Find out critical load for a fixed base portal frame whose beam has the same stiffness of column and that is laterally restrained. (symmetric buckling) **(08)**

OR

B) Derive an expression for critical load of a plate uniformly compressed in one direction. **(08)**

Q.4 A) Explain torsional load-deformation characteristics of structural members. **(07)**

OR

A) Explain torsional and torsional-flexural buckling of columns. **(07)**

B) Find out critical load for a fixed base portal frame free to move laterally at the top using neutral equilibrium. (side way buckling) **(08)**