M.Tech. 2nd Semester (Civil Engg.) Specialization in Structural Design Examination, May–2017
STABILITY OF STRUCTURES
Paper–MTSD–202

Time allowed : 3 hours] _[Maximum marks : 100_

Note : _Attempt five questions. Assume any data if missing._

1. What is buckling of columns ? What are different types of stability ? Also explain different modes of buckling.

    20

2. A circular column of 4.75 m high is effectively held in position at both ends and restrained against rotation at one end. Design the column to carry an axial load of 1500 kN, if its dia restricted to 400 mm. Use M20 mix & Fe 415 steel.   20

3. Define the general and local stability of beams in detail and also explain the effect of vertical loading on bending stiffness.   20

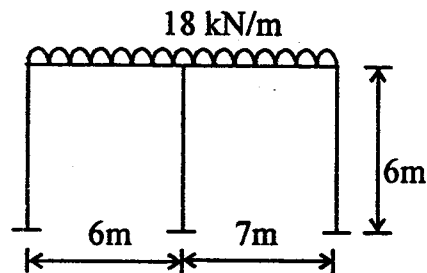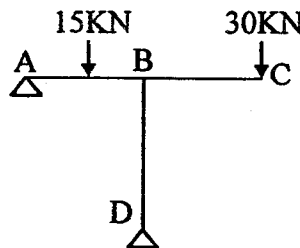4. What is an energy principle ? Also explain Numerical method in detail.   20

5. Analyse the rigid two bay symmetrical frame shown in figure by slope deflection method. EI is constant for all members of the frame. 20

18 kN/m

6m

6m   7m

6. Analyse the following frame : AB = 5m; BC = 5m; BD = 6m. The point loads of 15 kN are acting at Centre of AB and 30 kN at end C. 20

15KN   30KN

A   B   C

D

7. What is finite difference method ? Explain its applications in detail. 20

8. Derive the expression for the buckling of non-uniform compressed plate. 20

23422