Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov / Dec – 2019**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **Code :** | **18CE3015** | **Duration :** | **3hrs** |
| **Sub. Name :** | **THEORY OF STRUCTURAL STABILITY** | **Max. Marks :** | **100** |

|  |  |  |  |
| --- | --- | --- | --- |
| **Q. No.** | **Sub Div.** | **Questions** | **Marks** |
|  |  | **PART A (5 X 16= 80 MARKS)**  **(Answer any five from the following)** |  |
| 1. | a. | Distinguish between strength, stiffness and stability requirement of a structure. | 04 |
| b. | Explain Energy approach for buckling of column. | 04 |
| c. | Determine the critical load of column with both ends fixed. | 08 |
|  |  |  |  |
| 2. | a. | Analyze an eccentrically loaded column for the load deflection response at critical load. | 08 |
| b. | Develop the equation for effect of shear on buckling capacity of a column. | 08 |
|  |  |  |  |
| 3. | a. | Distinguish between the buckling behavior column, plate and shell. | 04 |
|  | b. | Compute the critical load for sway buckling of the portal frame shown.  EI is same for both the columns and beam | 12 |
| 4. | a. | Distinguish between flexural buckling, torsional buckling and torsional – flexural buckling. | 04 |
| b. | Develop the expression for critical stress due to lateral buckling of a simply supported I beam in pure bending. | 12 |
|  |  |  |  |
| 5. | a. | Explain the post buckling behavior of plate. | 04 |
| b. | Find the critical load of a square plate with simply supported edges subjected to equal biaxial compression by Finite difference method. | 12 |
| 6. | a. | Explain Tangent modulus theory. | 04 |
| b. | Determine the critical load of a hinged-hinged column shown in given fig. | 12 |
| 7. | a. | Explain the limitation of Euler buckling theory of column. | 04 |
|  | b. | Develop the expression for critical stress due to lateral buckling of a simply supported I beam carrying a central concentrated load. | 12 |
|  | | **PART- B (1 X 20= 20 MARKS)** |  |
| 8. | a. | Determine the critical stress for cylindrical shell subjected to axial compression. | 10 |
|  | b. | Distinguish between imperfection sensitive and imperfection insensitive systems with examples. | 05 |
|  | c. | Explain snap through buckling of shell with an example. | 05 |