MINOR 2 :CVL756
ADVANCED STRUCTURAL ANALYSIS (2016-17)

Time allowed: 1hour   **Date:** 10 October 2016
Venue: LH 606   **Max marks**   :   **20**

NOTE: (a) All questions are compulsory. (b) Draw neat and clear sketches wherever required.
(c) Assume suitable data if necessary. (d) Assume members as _inextensible_ unless otherwise
stated. (e) All answers must be supported by calculations/ justification to secure assigned
marks.

Q1. Condense the 3x3 stiffness matrix of the structure shown in Fig. 1 into 1x1 in terms of the horizontal deflection.   **(4 marks)**

Figure 1

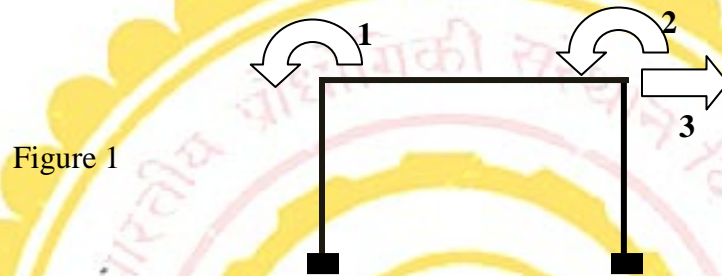**Q2.** State any three situations where the method of substructures could be useful for structural analysis**.**   **(3 marks)**

Q3. Identify the probable failure mechanisms and determine the plastic load capacity of the structure shown in Fig. 2. Using yield/ equilibrium criteria, show that the mechanism corresponding to the second lowest failure load is not the correct failure mechanism.
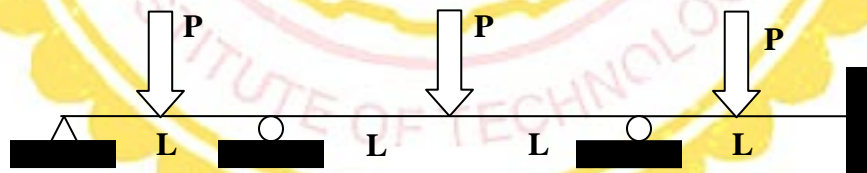   **(8 marks)**

Figure 2

Q4. For the structure shown in Figure 3, determine the deflection at point B using the **matrix flexibility** approach. **Assume both members to have same EI**
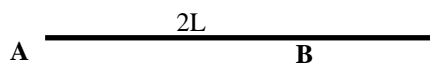   (**5 marks**)

Figure 3