Paper Code: MTCE-101	**Roll No.**										

M.Tech.
FIRST SEMESTER EXAMINATION, 2016-17
ADVANCED STRUCTURAL ANALYSIS

[Time: 3 Hours] [Max. Marks: 70]

Note:- Attempt All questions. All questions carry equal marks**.** Assume suitable data if required.

1. Attempt any two parts of the following: - **[7.5x2= 15]**

(a) Discuss the Determinate vs Indeterminate structures with reference to their structural behavior.
(b) How the Degree of Indeterminacy is calculated. Explain the methods.Explain with help of three examples for Continuous beam, Building frame and building truss.

(c) What is Masonry Structures? Discuss the load path and load transfer mechanism in these structures. Discuss the limitations of masonry structures.

2. Attempt any two parts of the following: - **[7.5x2= 15]**

(a) What are the various classical methods of Structural analysis? Explain each one of them in brief.
(b) What is the need of Matrix methods of Analysis for structures? Explain Flexibility method and Stiffness method with examples.

(c) What is a moment resisting building frame? Discuss various elements of this frame. Explain the conditions under which sway analysis and non-sway analysis of framed structures is done.

3. Attempt any two parts of the following: - **[7.5x2= 15]**

(a) Derive the three equations of Flexibility method of analysis by taking suitable example.

(b) Solve the continuous beam shown in **Figure-1** treating reaction at support" B" and support C as redundant forces by using Flexibility method of analysis.EI constant .
(c) What is a Truss? Discuss the Assumptions made in the analysis of trusses. Explain load transfer mechanism in a truss.

4. Attempt any two parts of the following: - **[7.5x2= 15]**

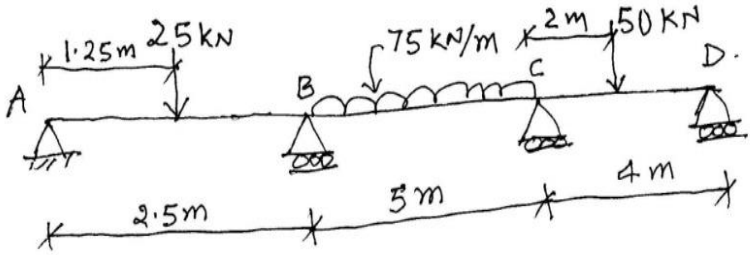
(a) Derive the three equations of Stiffness method by taking suitable example.
(b) By using the stiffness method calculate the reactions in building frame given in **Figure-2** at support **C.** EI=constant
(c) Derive a flexibility matrix of fix ended cantilever beam of span **"L".** Neglect axial deformations.

5. Attempt any two parts of the following: - **[5x2= 10]**

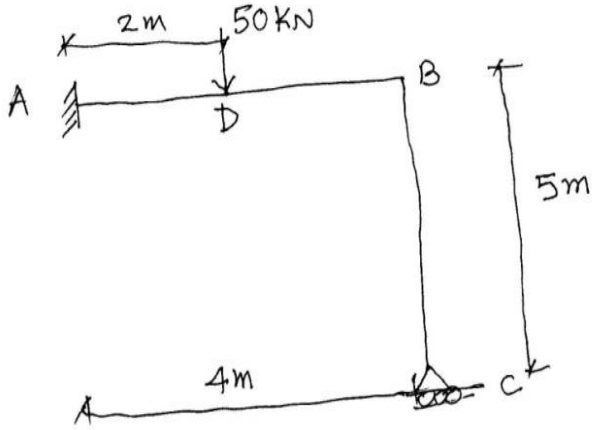
(a) Why a shear wall is used in high rise buildings ? Discuss how the Shear wall is placed in a building with help of neat sketches in Plan with their advantages.

(b) With the help of Neat sketches ,Explain the behavior of rectangular Shear wall when provided in X direction and Y direction in plan of a High Rise multi story Building.

(c) What do you mean by coupled shear wall .Explain with neat sketches the reinforcement details in a coupled shear wall.



Q3(b) FIGURE-1



Q4(b) FIGURE-2