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Name : .....

Reg. No: .....

**SIXTH SEMESTER B.TECH DEGREE EXAMINATION, MAY 2012**

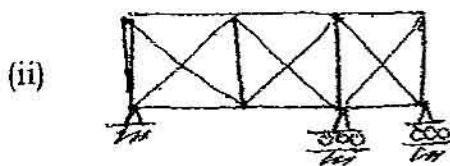
**CE 09 603 STRUCTURAL ANALYSIS III**

Time : 3 Hours

Max. Marks: 70

**PART - A (Answer all questions) (5 x 2 MARKS = 10 MARKS)**

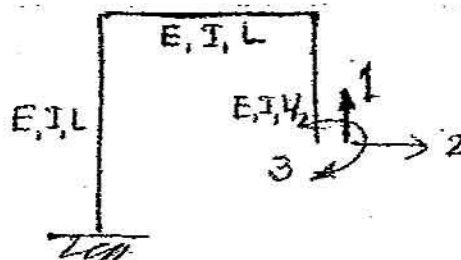
1. a. Explain the concept of equivalent joint loads.
- b. Find the static and kinematic indeterminacies of the following structures



- c. State and prove the relation between stiffness matrix and flexibility matrix.
- d. Discuss the advantages of using direct stiffness method of analysis.
- e. Explain the term logarithmic decrement.

**PART B - Answer any four questions (4 x 5 marks = 20 marks)**

2. (a) Generate the force transformation matrix for the frame shown below.



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- (b) Derive the element stiffness matrix for the beam element shown in fig. below.



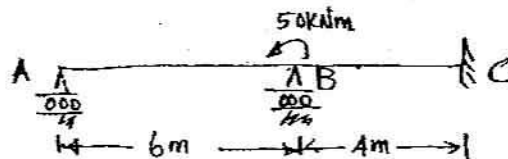
- (c) Find the deflection at the free end of a cantilever beam shown below using flexibility method.



- (d) Derive an equation of motion for a SDOF system using energy method.  
 (e) Explain various types of damping methods briefly.  
 (f) Distinguish between determinate and indeterminate structures briefly.

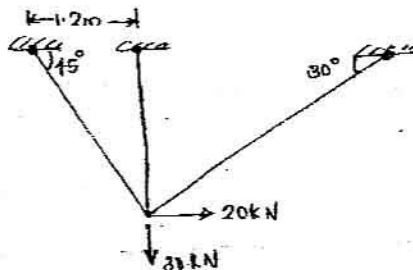
**PART C - Answer all questions (4 x 10 marks = 40 marks)**

3. (a) Analyse the continuous beam shown below using flexibility method. Assume  $E = 200 \text{ GPa}$ ,  $I_{AB} = 2 \times 10^8 \text{ mm}^4$ ,  $I_{BC} = 5 \times 10^7 \text{ mm}^4$ .



OR

- (b) Determine the forces in the members of the pin-jointed frame shown below using flexibility method.



4. (a) Analyse the frame shown below by stiffness method and draw the BMD.

