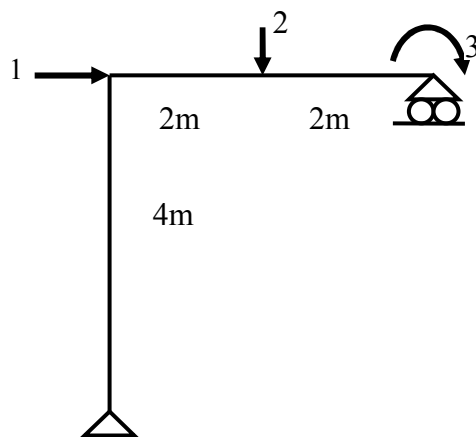


**GUJARAT TECHNOLOGICAL UNIVERSITY****M.E Sem-I Regular Examination January / February 2011****Subject code: 712001N****Subject Name: Advanced Structural Analysis****Date: 31 /01 /2011****Time: 02.30 pm – 05.00 pm****Instructions:****Total Marks: 70**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
- 4.

- Q.1 (a)** Derive flexibility matrix for the structure shown below in fig for given structural Coordinates. EI is constant **07**



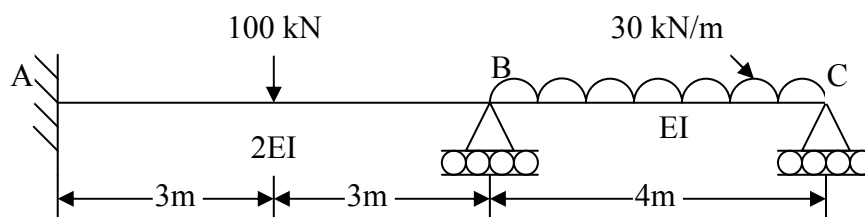
- (b)** Explain basic principles of sub structuring and its merits. **07**

- Q.2 (a)** Derive stiffness matrix for a beam element considering shear deformation **07**  
**(b)** Explain Non linear and linear response of a structure stating reasons of Non linearity. **07**

**OR**

- (b)** Derive member stiffness matrix for truss element considering Non linear deformation. **07**

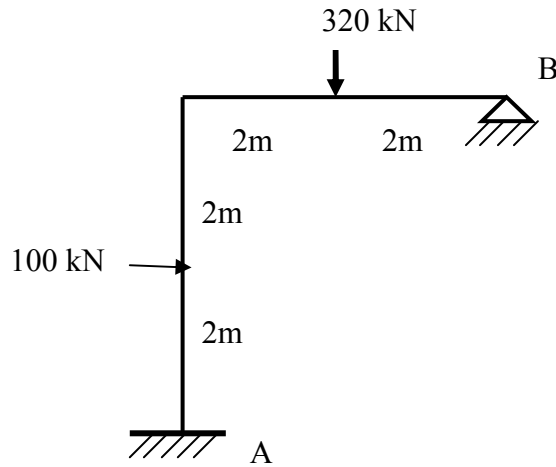
- Q.3 (a)** Develop the flexibility matrix for the beam shown below, considering reactions at Band C as redundants. **07**



- (b)** Analyze the beam shown in Q 3(a) and draw bending moment diagram by flexibility method. **07**

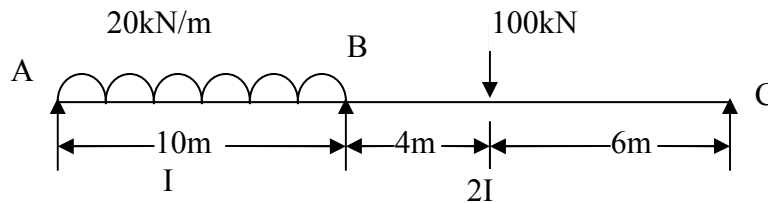
**OR**

- Q.3 (a)** Develop the flexibility matrix for the bent shown below, considering reactions at B as redundants. EI constant. **07**



- (b) Analyze the bent shown in Q 3(a) and draw bending moment diagram by flexibility method. 07

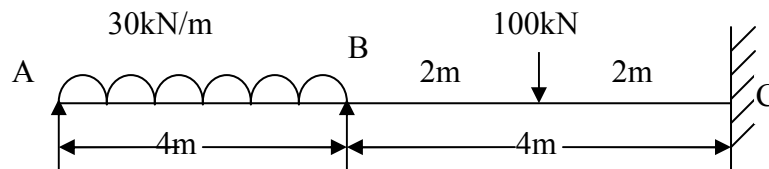
**Q.4 (a)** Develop stiffness matrix for the beam shown below. 07



- (b) Analyze the beam shown above in Q 4(a) and draw bending moment diagram by stiffness method 07

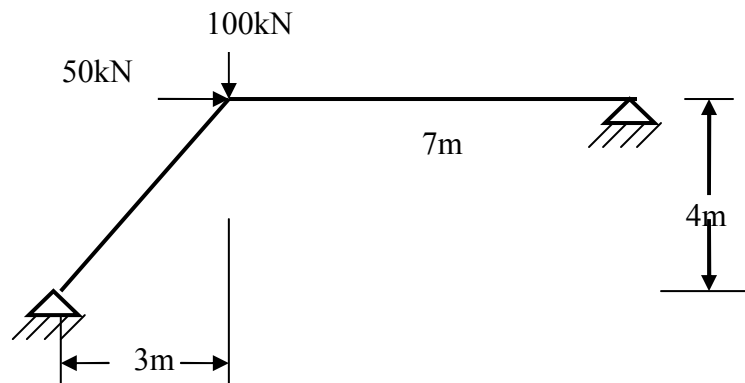
**OR**

**Q.4 (a)** Derive the stiffness matrix for the beam shown below. EI is constant. 07

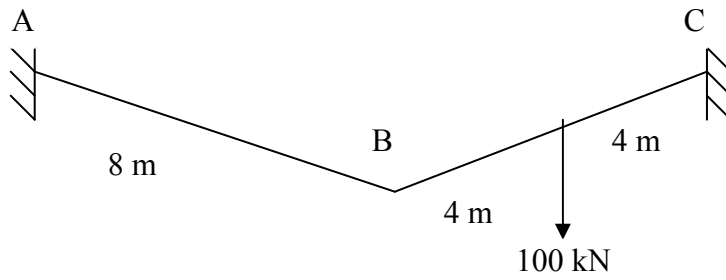


- (b) Analyze the beam shown above in Q 4(a) and draw bending moment diagram by stiffness method, if support A is restrained by rotational stiffness of  $0.15EI$ . 07

**Q.5 (a)** Analyze the structure shown below by stiffness method or flexibility method. EI constant 07

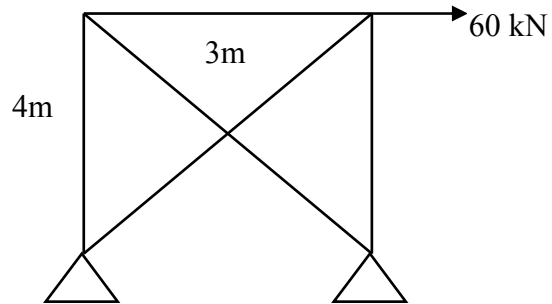


- (b) Develop the stiffness matrix for and determine displacements at the joint B of the grid shown below.  $GJ = 0.8EI$  07

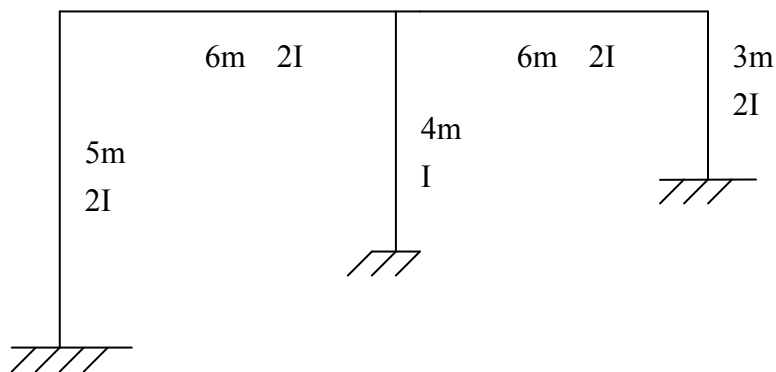


**OR**

- Q.5 (a) Analyze the truss shown in figure by any method.  $EA$  is constant for all members. 07



- (b) Develop stiffness matrix for the frame shown below. 07



\*\*\*\*\*