

## II B. Tech II Semester Regular Examinations, November - 2018

## STRUCTURAL ANALYSIS-I

(Civil Engineering)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)

2. Answer **ALL** the question in **Part-A**

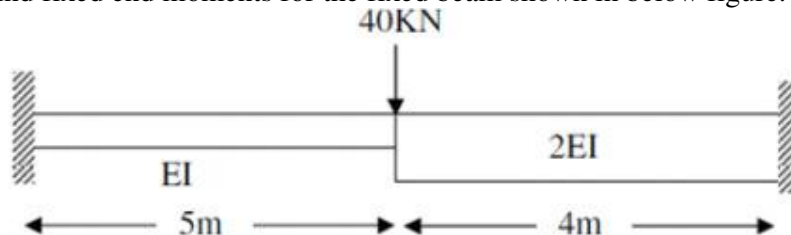
3. Answer any **FOUR** Questions from **Part-B**

**PART -A**

1.
  - a) What is the degree of indeterminacy of a propped cantilever?
  - b) How fixed beams can be statically determinate?
  - c) Define a continuous beam.
  - d) What are the sign conventions used in slope deflection equations and write the equations.
  - e) Define strain energy and complimentary strain energy.
  - f) Draw the influence diagram for a shear force at any section of a simply supported beam?

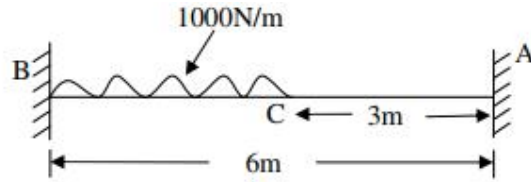
## PART -B

2.
  - a) A cantilever of length 4m carries a uniformly distributed load of 1kN/m length over the whole length. The free end of the cantilever is supported on a prop. If  $E = 2 \times 10^5 \text{ N/mm}^2$  and  $I = 10^8 \text{ mm}^4$ , then (i) find the prop reaction (ii) deflection at the centre of cantilever
  - b) A cantilever of 6m length carries an U.D.L of 12 kN/m over the full span. If the free end is supported by a prop, find the reaction at the prop and also draw the S.F. and B.M. diagrams
3. Find fixed end moments for the fixed beam shown in below figure.



4. A continuous beam ABC is simply supported at A and C and continuous over support B with  $AB = 5\text{m}$  and  $BC = 6\text{m}$ . A uniformly distributed load of  $12\text{kN/m}$  is acting over the beam. The moment of inertia is  $I$  throughout the span. Analyse the continuous beam and draw S.F.D and B.M.D.
5. A Continuous beam is fixed at A and is supported over rollers at B and C.  $AB=BC=12\text{M}$ . The beam carries a uniformly distributed load of  $30\text{kN/m}$  over AB and a point load of  $240\text{kN}$  at a distance of  $4\text{M}$  from B on span BC. B has a settlement of  $30\text{mm}$ .  $E = 2 \times 10^5 \text{ N/mm}^2$ ,  $I = 2 \times 10^9 \text{ mm}^4$ . Analyse the beam by slope deflection method.

6. Determine the Reaction at A and the moment at B use strain Energy method



7. Draw the Influence line diagram for reactions of a simply supported beam of 12 m span. Also draw the influence line diagrams for Shear force and bending moments at quarter span and mid-span sections

