

Code No: RT22016

**R13****SET - 1**

**II B. Tech II Semester Supplementary Examinations, April-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 **THREE** Questions from **Part-B**
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**PART -A**

1.
  - a) Define deflection
  - b) Write about sinking of support
  - c) Write moment of inertia for I Section
  - d) Write the formula for slope for a cantilever beam with point load at end
  - e) Draw bending moment diagram for simply supported beam with point load at centre
  - f) Define influence line

**PART -B**

2. Draw the bending moment and shear force diagram of a propped cantilever beam of span 6m due to a point load of 6 kN at the mid span.
3. Find the fixed end moments for a fixed beam of span 6 m subjected to a concentrated clockwise moment of 10 kNm at 2.5 m from the left end
4. A continuous beam ABC consists of spans AB and BC of lengths 4m and 6m respectively, the ends A and B being fixed. C is a free end. The span AB carries a uniformly distributed load of 24 kN/m while the span BC carries a point load of 108 kN at a distance of 2m from C. Find the support moments and support reactions
5. A simply supported beam of span 6m is subjected to a concentrated load of 45 KN at 2m from the left support. Calculate the deflection under the load point. Take  $E = 200 \times 10^6 \text{ KN/m}^2$  and  $I = 14 \times 10^{-6} \text{ m}^4$ .
6. Define Strain energy. Derive an expression for strain energy due to bending moment.
7. Draw the influence line diagram for B.M at a point 8m from the left abutment on a bridge girder of span 30m and find the maximum B.M at that point due to a series of wheel loads 80kN, 160kN, 160kN and 160kN at centre to centre distances of 4m, 2.5m, 2.5m and 2.5m respectively. The loads can cross in either directions with the 80kN load leading.