Code No: RT22016 **R13** SET - 1

II B. Tech II Semester Supplementary Examinations, Nov/Dec-2016
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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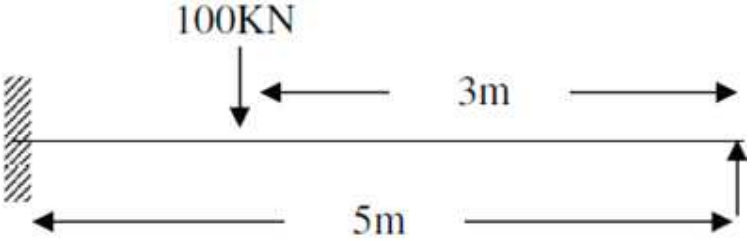
PART –A **[22M]**

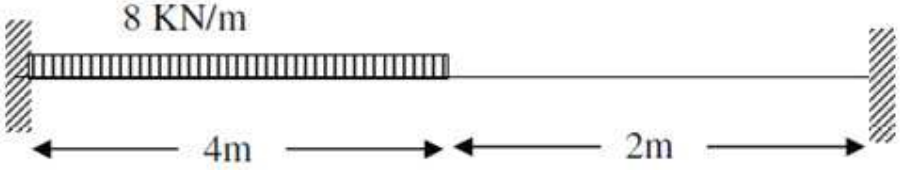
1. a) Write the difference between statically determinate and indeterminate structure?
   b) Write down the compatibility conditions for a fixed beam.
   c) What is a continuous beam? Explain the significance of choosing the bending moment as redundant by clapeyron in place of support reactions?
   d) Explain the terms Static Indeterminacy, Kinematic Indeterminacy and Degree if Indeterminacy.
   e) Explain briefly about strain energy in linear elastic system.
   f) Draw the influence diagram for a shear force at any section of a simply supported beam?

PART –B **[3×16=48M]**

2. Find the support moment for the propped cantilever loaded as shown in below figure if the support rotates clockwise by 0.003 radians. EI= 1×10^6 kgm^2.



3. Find fixed end moments for the fixed beam shown in below figure.



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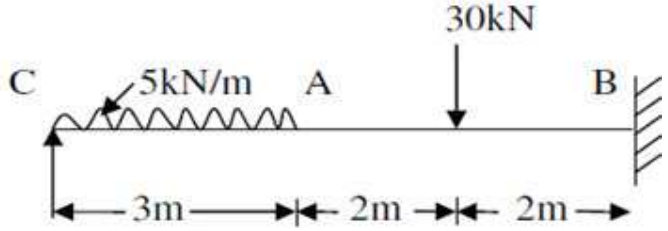
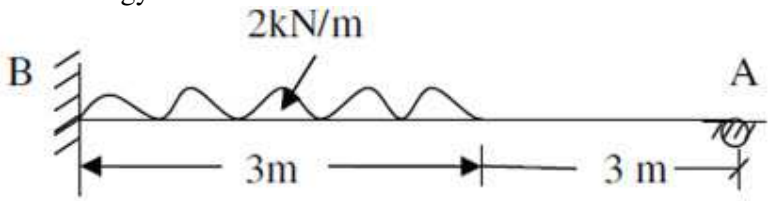
4. Draw the Shear force and bending moment diagram for the beam shown in below Figure. Use Clapeyorn's theorem of three moments. EI=1x10^5 N/mm^2.



5. A continuous beam is built in at A and it is carried over rollers at B and C with spans of AB and BC being 10m. The beam carries a uniformly distributed load of 7.5KN/m over AB and a point load of50KN over BC 2.5m from the support B, which sinks by 20mm. Values of E and I are 2 * 10^5N/mm^2 and 2 *$10^9$$mm^4$. Calculate the support moments and draw bending moment diagram giving critical values. Use Slope deflection method.

6. Determine the Reaction at A and the moment at B as shown in below Figure. Use Strain Energy method.



7. A System of five loads 75kN, 150kN, 150kN, 75kN and 50kN crosses a beam of 15m span with75kN leading the distance between the loads are 2.4m, 3.0m, 2.4m and 1.8m respectively. Find Maximum Bending Moment at the center of the span. Also find the absolute Maximum Bending Moment on the beam.

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