PRESIDENCY UNIVERSITY, BENGALURU
SCHOOL OF ENGINEERING

Max Marks: 40   Max Time: 120 Mins   Weightage: 40 %

END TERM FINAL EXAMINATION

I Semester AY 2017-2018   Course: **CIV 209 - Structural Analysis - II**   18 December 2017

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Instructions:
  i.   Write legibly and draw clear diagrams wherever required. Solving the problem in pencil is not allowed. Units if not written will be penalized.
 ii.   Diagrams to be drawn using a pencil and scale only. Pen diagrams will be penalized.
 iii. Scientific and non-programmable calculators are permitted.
 iv.   If the correct question number and part is not mentioned, the answer will be marked wrong.

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Part A

(2 Q x 5 M= 10 Marks)

1. Derive the expression for length of cable (parabolic) when supports are at different levels.

2. Find the maximum deflection and slope at the support for a simply supported beam with span 'L' and uniformly distributed load (UDL) of 'W per meter run'.

Part B

(1 Q x 14 M= 14 Marks)

3. A suspension cable is suspended from two piers 200 m apart, the left support being 5 m above the right support. The cable carries a UDL of 1.5 kN/m and has its lowest point 10 m below the lower support. The ends of the cable are attached to saddle on rollers atop of piers and a backstay (anchor cable) which may be assumed straight are inclined at 60° to the vertical. Determine:

    (a) Maximum tension in the cable.

    (b) The tension in the backstays.

    (c) The thrust on each pier.

4. Analyse the given frame shown in Figure 1 by slope deflection method and draw the Bending Moment Diagram (BMD).

Figure 1

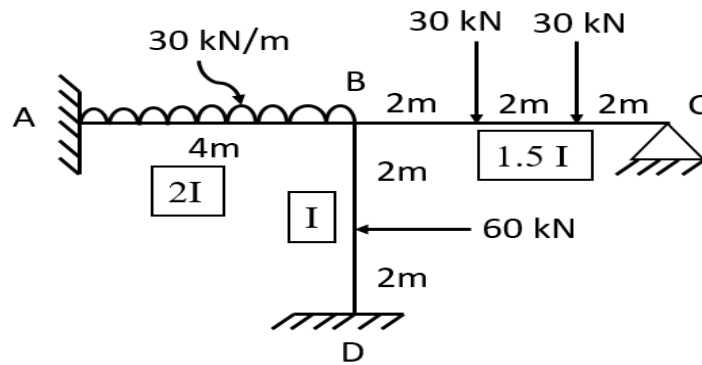Max Marks: 20   Max Time: 60 Mins   Weightage: 20 %

TEST 2

I Semester AY 2017-2018   Course: **CIV 209 - Structural Analysis - II**   27 October 2017

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Instructions:
  i. Write legibly and draw clear diagrams wherever required. Solving the problem in pencil is not allowed. Units if not written will be penalized.
  ii. Diagrams to be drawn using a pencil and scale only. Pen diagrams will be penalized.
  iii. Scientific and non-programmable calculators are permitted.
  iv. If the correct question number and part is not mentioned, the answer will be marked wrong.

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Part A

(1 Q x 4 M= 4 Marks)

1. Analyse the given frame shown in figure 1 by stiffness matrix method and answer the following:

   a. Calculate the Degree of Redundancy of the beam and identify the redundants.   [1 Mark]
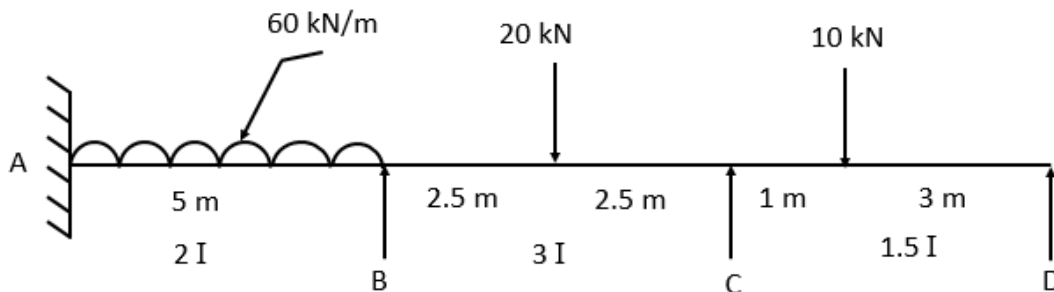   b. Calculate the Fixed End Moments.   [3 Marks]

Figure 1

Part B

(1 Q x 8 M= 8 Marks)

2. Refer to Figure 1 of Part A and answer the following:

   a. Calculate the Net Moments on the beam.   [2 Marks]
   b. Perform the Stiffness Matrix Analysis.   [6 Marks]

Part C

(1 Q x 8 M= 8 Marks)

3. Refer to Figure 1 of Part A and answer the following:

   a. Calculate the Redundants.   [1 Mark]
   b. Calculate the Final Moments.   [2 Marks]
   c. Calculate the Shear Force acting on the beam.   [2 Marks]
   d. Draw the Bending Moment Diagram and Shear Force Diagram.   [3 Marks]

Max Marks: 20   Max Time: 60 Mins   Weightage: 20 %

TEST 1

I Semester 2017-2018   Course: **CIV 209 - Structural Analysis - II**   16 September 2017

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Instructions:
  i.   Write legibly and draw clear diagrams wherever required.
  ii.   Diagrams to be drawing using a pencil and scale only. Pen diagrams will be penalized.
  iii. Scientific and non-programmable calculators are permitted.

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Part A

(1 Q x 4 M= 4 Marks)

1. Analyse the given frame shown in figure 1 by moment distribution method and answer the following:

   a. Calculate the Fixed End Moments   [2 Marks]
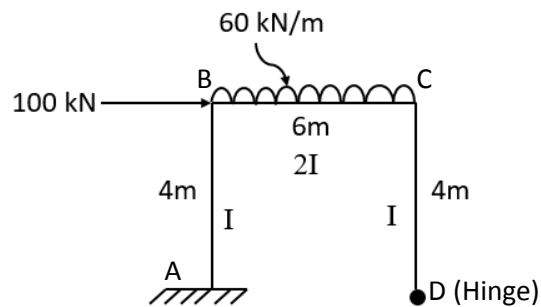   b. Calculate the Distribution Factors for the given frame.   [2 Marks]

Figure 1

Part B

(1 Q x 6 M= 6 Marks)

2. Refer to Figure 1 of Part A and answer the following:

   a. Perform the Moment Distribution Analysis.   [3 Marks]
   b. Calculate the Additional Moments that occur due to Sway.   [3 Marks]

Part C

(1 Q x 10 M= 10 Marks)

3. Refer to Figure 1 of Part B and answer the following:

   a. Perform the Sway Analysis   [3 Marks]
   b. Calculate the Final Moments   [4 Marks]
   c. Draw the Bending Moment Diagram.   [3 Marks]