



<b>ID NO.</b>	
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**PRESIDENCY UNIVERSITY, BENGALURU**

**SCHOOL OF ENGINEERING**

Weightage: 40 %

Max Marks: 80

Max Time: 2 Hrs

7 May 2018, Monday

**ENDTERM EXAMINATION MAY 2018**

Even Semester 2017-18

Course: **CIV 205 Structural Analysis - I**

IV Sem. Civil

**Instructions:**

- (i) Read the question properly and answer accordingly.
- (ii) Question paper consists of 4 parts and 3 pages.
- (iii) Write legibly and draw clear diagrams wherever required.
- (iv) Diagrams to be drawing using a pencil and scale only. Pen diagrams will be penalized.
- (v) Scientific and non-programmable calculators are permitted.

**Part A**

(5 Q × 4 M = 20 Marks)

1. What are the conditions of equilibrium?
2. Define Static Indeterminacy
3. Define Degree of internal indeterminacy
4. Write the differences between a pulley support and saddle with roller support in relation to cable support system
5. Derive an expression to find out length of a cable subjected to a uniformly distributed load when the supports are at the same level.

**Part B**

(1 Q × 15 M = 15 Marks)

- 6a. A suspension cable is suspended from two piers 300m apart. The left support being 6m above the right. The cable carries a UDL of 2 kN/m and has its lowest point 12m 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 50° to the vertical. Determine:
- (a) Maximum tension in the cable
  - (b) The tension in the backstay
  - (c) The thrust on each pier

**OR**

- 6b. A symmetrical three-hinged parabolic arch has a span of 15m and a central rise of 5m. It is subjected to a UDL of 20 kN/m for a length of 7.5m starting from the left hand support. Draw the Bending moment Diagram (BMD) showing the position of maximum positive and maximum negative bending moment with its magnitude. Also, calculate the normal thrust and radial shear at a distance 5m from the left support.

### Part C

(1 Q × 20 M = 20 Marks)

7a. Analyse the truss shown in figure 1 using the method of joints and tabulate the results obtained.

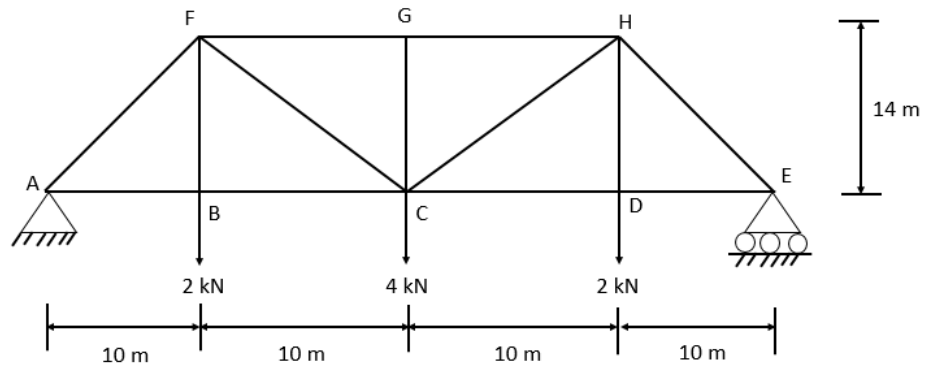


Figure 1

**OR**

7b. Analyse the truss show in figure 2 for the members FG, FC, BC, AF & AB using the method of sections and tabulate the results.

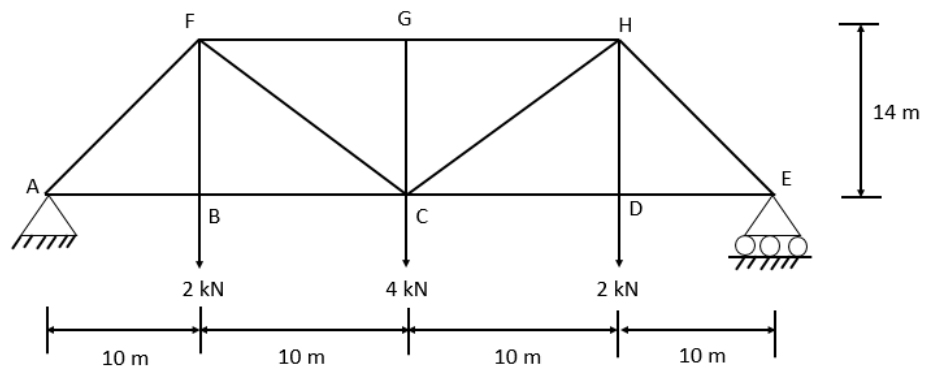


Figure 2

### Part D

((1 Q × 10 M) + (1 Q × 15 M) = (25 Marks))

8. Analyse the given beam in figure 3 using conjugate beam method and find the maximum deflection

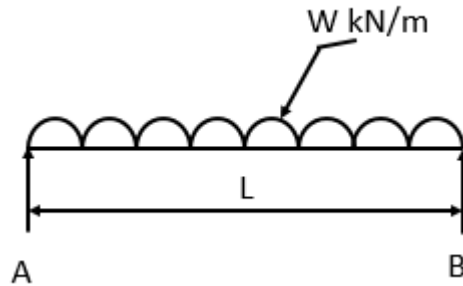


Figure 3

9. Analyse the given beam in figure 4 using consistent deformation method and draw the Bending Moment Diagram and Shear Force Diagram. The support B sinks by 6 mm. Take  $EI = 10^5$  kNm<sup>2</sup>

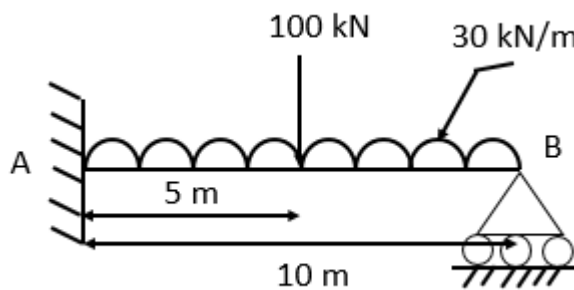


Figure 4



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**PRESIDENCY UNIVERSITY, BENGALURU**  
**SCHOOL OF ENGINEERING**

Weightage: 20%

Max Marks: 40

Max Time: 1 hr

26 March Monday 2018

**TEST - 2**

**SET B**

Even Semester 2017-18

Course: **CIV 205 Structural Analysis - I**

IV Sem. Civil

**Instructions:**

- (i) Read the question properly and answer accordingly.
- (ii) Question paper consists of 3 parts.
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- (v) Scientific and non-programmable calculators are permitted.

**Part A**

(3Q = 10 Marks)

1. State Eddy's Theorem. [2M]
2. For the bending moment at the base of the pier not to be zero, what is the type of support provided? Write the expression for net horizontal and vertical thrust for that support. [3M]
3. Derive an expression to find out length of a cable subjected to a uniformly distributed load when the supports are at different levels. [5M]

**Part B**

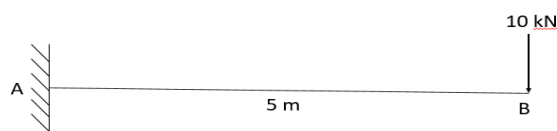
(1Q x 15 M = 15 Marks)

4. A suspension cable is supported at 2 points 200 m apart. The left support is 5 m above the right support. The cable is loaded with a uniformly distributed load of 10 kN/m throughout the span. The maximum dip in the cable from the left support is 10m. Find the maximum tension, length of cable, area of cable if the permissible stress is 800 N/mm<sup>2</sup>. Also find tension in the backstay if the cable is attached to saddle on roller support at the top of piers and the backstay is inclined at an angle of 45° to vertical.

**Part C**

(2Q = 15 Marks)

5. What is a conjugate beam? State the two theorems of Conjugate Beam Method. [5M]
6. Determine the deflection under the load for a cantilever beam shown in Figure 1. The Young's Modulus E is 200 kN/mm<sup>2</sup> and I = 5 × 10<sup>-5</sup> m<sup>4</sup>. [10M]



**Figure 1**



**PRESIDENCY UNIVERSITY, BENGALURU**  
**SCHOOL OF ENGINEERING**

Weightage: 20 %

Max Marks: 40

Max Time: 1 Hr

19 Feb Monday 2018

**TEST 1**

Even Semester 2017-18

Course: **CIV 205 Structural Analysis - I**

IV Sem. Civil

**Instructions:**

- (i) Read the question properly and answer accordingly.
- (ii) Question paper consists of 3 parts.
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**Part A**

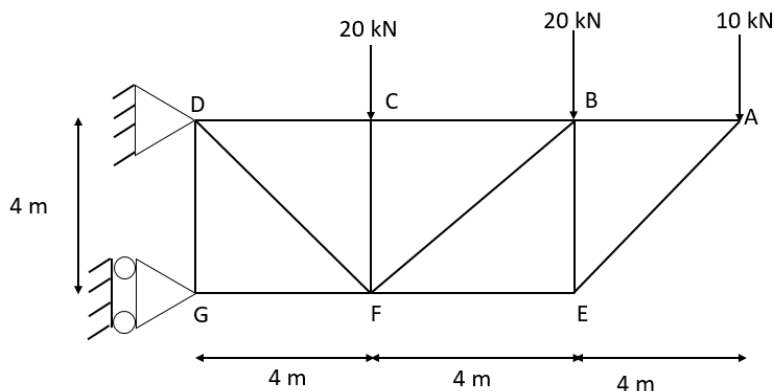
(5Q x 2M = 10 Marks)

1. What is a Statically Indeterminate Structure?
2. What are the assumptions made in truss analysis?
3. Classify arches based on supports.
4. Write the expression to calculate the vertical intercept and slope of an arch at any given distance 'x' from the left support.
5. What is the most basic form of a truss?

**Part B**

(1 Q x 14 M = 14 Marks)

6. Analyse the truss shown in Figure 1 by the method of joints and tabulate the results.



**Figure 1**

**Part C**

(1 Q x 16 M = 16 Marks)

7. A symmetrical three-hinged parabolic arch has a span of 30m and a central rise of 5m. It is subjected to a UDL of 40 kN/m for a length of 15m starting from the left hand support. Draw the Bending moment Diagram (BMD) showing the position of maximum positive and maximum negative bending moment with its magnitude.