

CE C30/ME C85, Section 2, Midterm Examination

Open books and notes, online, 50 minutes

Maximum of 3 one-sided pages per problem

April 10, 2020

LAST NAME: _____

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BOX YOUR ANSWERS

<p>NUMBER PAGES PER PROBLEM</p> <p>Page 1.1, Page 1.2, ...</p> <p>Page 2.1, ...</p> <p>...</p>

Problem 1:	/40
Problem 2:	/25
Problem 3:	/35
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TOTAL:	/100

CE C30/ME C85, Section 2, Spring Semester 2020

Online Examinations Honor Code Statement

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- (1) I have worked out this examination individually,**
- (2) I have not discussed nor communicated about any part of the exam with anybody, in any way, during the exam,**
- (3) I have complied with the time assigned to the exam and its submission, acknowledging that no late submissions are accepted, and**
- (4) The pages included in the PDF file that I am submitting form the totality of my exam, complying with the limitation of three one-sided pages maximum per problem.**

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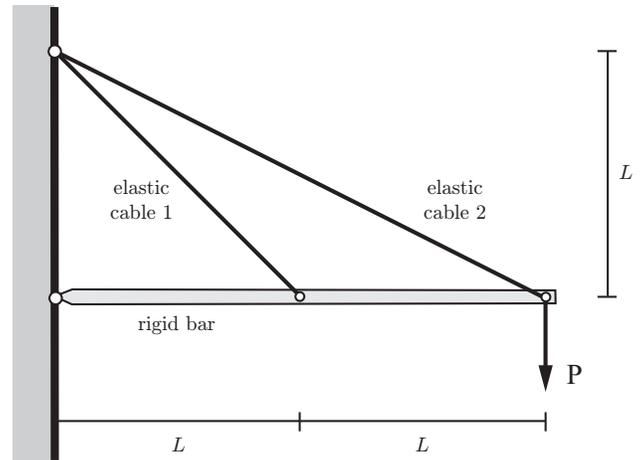
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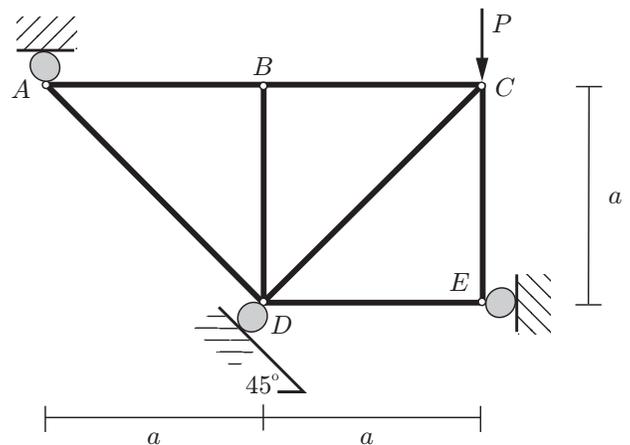
Problem #1 (40%)

A rigid bar is being held horizontally by two elastic cables in the configuration depicted in the figure, while being loaded by a vertical load (P) at its right tip as shown. The cables can be considered linear elastic with an equal Young modulus E and a cross section area A . All connections are pinned, and all members can be considered weightless.

Determine: (1) the force in the cables, and (2) the deflection of the bar at its right tip.

**Problem #2 (25%)**

1. Determine the forces in all the members in the truss of the figure when the vertical load of value P shown in the figure is applied. Indicate clearly if the member is in tension or compression.
2. If all the members have the same $0.1 \times 0.1 \text{ m}^2$ square cross section, determine the maximum load value P that can be applied with a factor of safety of 1.5 if the material can only take 10 MPa in tension or compression.



Remark: Express your results in terms of the length a if needed.

Problem #3 (35%)

Draw the axial force, transversal shear force and bending moment diagrams for the beam shown in the figure. Indicate the characteristic values (min/max values, values at the ends and supports, slopes, linear/parabolic/cubic distributions,...).

