QUIZ 1

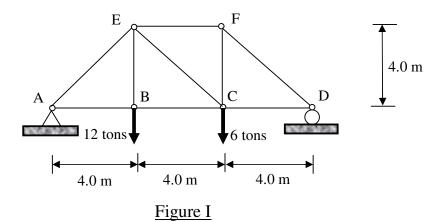
Spring 2005-2006

(Wednesday March 22, 2006)

CIVE311 – STRUCTURES I CLOSED BOOK, 1 & 1/2 HOURS

Name:	<u>ID#:</u>
<u>NOTES</u>	
ONE EXTRA SHEET IS PROVIDED A ASK FOR ADDITIONAL SHEETS IF SOME ANSWERS MAY REQUIRE MU DO NOT USE THE BACK OF THE SHEET DRAFT BOOKLET WILL BE PROVIDE BOTH QUESTION SHEETS AND DRAFT	YOU NEED MORE SPACE. CH LESS THAN THE SPACE PROVIDED. ETS FOR ANSWERS.
DO NOT WRITE IN	N THE SPACE BELOW
MY COMMENT(S)	
<u>YOUR GRADE</u>	Problem I:/30 Problem II:/70 Other:
	<u>TOTAL:</u> /100

Problem I: (30 points)



1. Referring to the weightless plane truss shown in <u>Figure I</u>, compute the reactions and the forces in members FR BC FC and FF (10 points)

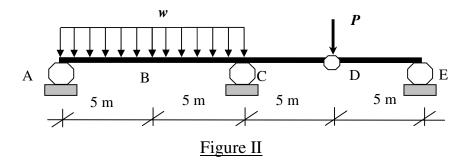
forces in members EB, BC, EC, and EF. (10 points)	
Calculations and/or Diagrams:	

Calculations and/or Diagrams (cont'd):

2.	Draw the influence lines of: Reactions at A, and member forces EB and EC, for a load moving vertically downward along ABCD. (10 points) From influence lines, compute the reactions and forces above for the loads shown in Figure I and compare with question 1. (5 points) If a uniform vertical load (down) of 3 tons/m is applied on AB and BC, calculate from influence line the force in member EC. Deduce an equivalent system of concentrated loads placed at nodes A, B, C, which will replace the uniform load on AB and BC (your system should lead to the same results for member force EC and this should be verified). (5 points)
	Calculations and Diagrams:

Calculations and Diagrams (cont'd):

Problem II: (70 points)

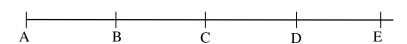


For the beam shown in <u>Figure II</u>, the own weight is neglected. <u>Your diagrams/sketches should include any feature/value you think is relevant or important.</u>

1. Let w=20 kN/m and P=20 kN

Compute the <u>reactions</u> in the beam, and draw the <u>shear</u> and bending <u>moment</u> diagrams; sketch the <u>deflected shape</u>. (20 points)

SHEAR:



MOMENT: A B C D E



Calculations and/or Diagrams (cont'd):

Calculations and/or Diagrams (cont'd):

2.	Referring to Figure II, draw the influence lines for R_A , R_E , M_B , M_D , V_C , and V_D . Draw in the order which you find appropriate. (25 points)
	Calculations and Diagrams:

Calculations and Diagrams (cont'd):

Calculations and Diagrams (cont'd):

3.	 Let w_D=10 kN/m (dead load); w_L=20 kN/m and P=20 kN (live loads) Compute the maximum absolute value for R_A, and show the corresponding loading position. (9 points)
	- Compute R_A for w_L on AC only and P on D and compare with question 1 (do not include w_D). (6 points)
	Calculations and Diagrams:

Calculations and Diagrams (cont'd):

4.	Compute the maximum absolute value of M_B for the truck load shown, assuming that the truck can travel in either directions, and show the corresponding position(s) of the truck. (10 points) $ \begin{array}{c} 10 \\ 5 \end{array} $
	Calculations and Diagrams:

EXTRA SHEET 1: Continued from page

culations and/or Diagrams:	

EXTRA SHEET 2: Continued from page

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Calculations and/or Diagrams:	