QUIZ 1
Spring 2006-2007
(Wednesday March 28, 2007)
CIVE311 – STRUCTURES I
CLOSED BOOK, 1 & 1/2 HOURS

Name: _____ **ID#:** _____

NOTES

- 1 PROBLEM – 4 QUESTIONS – 12 PAGES.
- ALL YOUR ANSWERS SHOULD BE PROVIDED ON THE QUESTION SHEETS.
- **TWO EXTRA SHEETS IS PROVIDED AT THE END.**
- **ASK FOR ADDITIONAL SHEETS IF YOU NEED MORE SPACE.**
- SOME ANSWERS MAY REQUIRE MUCH LESS THAN THE SPACE PROVIDED.
- ***DO NOT*** USE THE BACK OF THE SHEETS FOR ANSWERS.
- DRAFT BOOKLET WILL BE PROVIDED; BUT DO NOT USE FOR ANSWERS.
- BOTH QUESTION SHEETS AND DRAFT BOOKLET SHOULD BE RETURNED.
- CHECK BOXES ARE TO CONFIRM THAT YOU HAVE SOLVED A QUESTION. ☑

YOUR COMMENT(S)

_ _

_ _

DO NOT WRITE IN THE SPACE BELOW

MY COMMENT(S)

_ _

_ _

YOUR GRADE

Problem I-1:	_ _ _ /30
Problem I-2:	_ _ _ /35
Problem I-3:	_ _ _ /15
Problem I-4:	_ _ _ /20
Other:	_ _ _
	_____
TOTAL:	/100

Problem I/I: *(100 points = 30 + 35 + 15 + 20)*

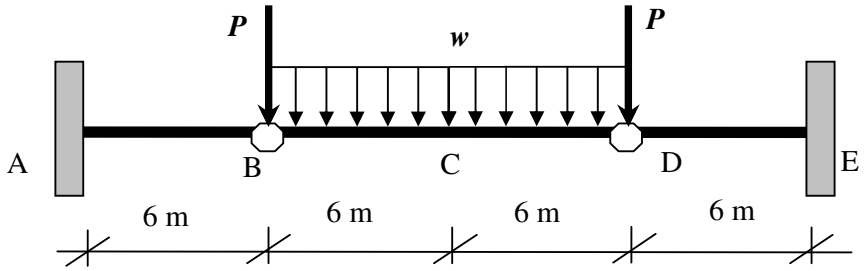
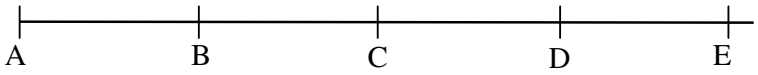


Figure I

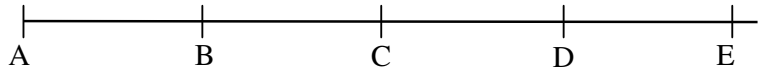
For the beam shown in Figure I, the own weight is neglected.
Your diagrams/sketches should include any feature/value you think is relevant or important.

1. Let ***w*=10 kN/m** and **P=20 kN**
   Compute the ***reactions*** (forces and moments) in the beam, and draw the ***shear*** and bending ***moment*** diagrams; sketch the ***deflected shape***. *(20 points)* ☐
   Can you compare the middle part BD, to a simpler beam? Draw this beam and briefly explain (no need for calculations; restrict your answer to a sketch of the beam and 2-3 lines of explanation). *(5 points)* ☐
   Can you compare the end parts AB or ED to a simpler beam? Draw this beam and briefly explain (no need for calculations; restrict your answer to a sketch of the beam and 2-3 lines of explanation). *(5 points)* ☐

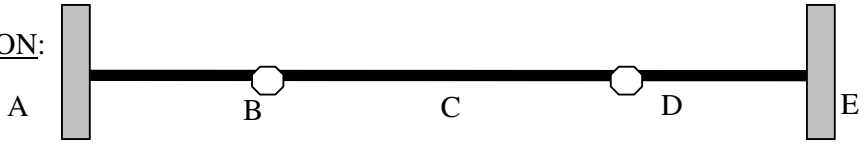
SHEAR:



MOMENT:



DEFLECTION:



Calculations and/or Diagrams (cont'd):

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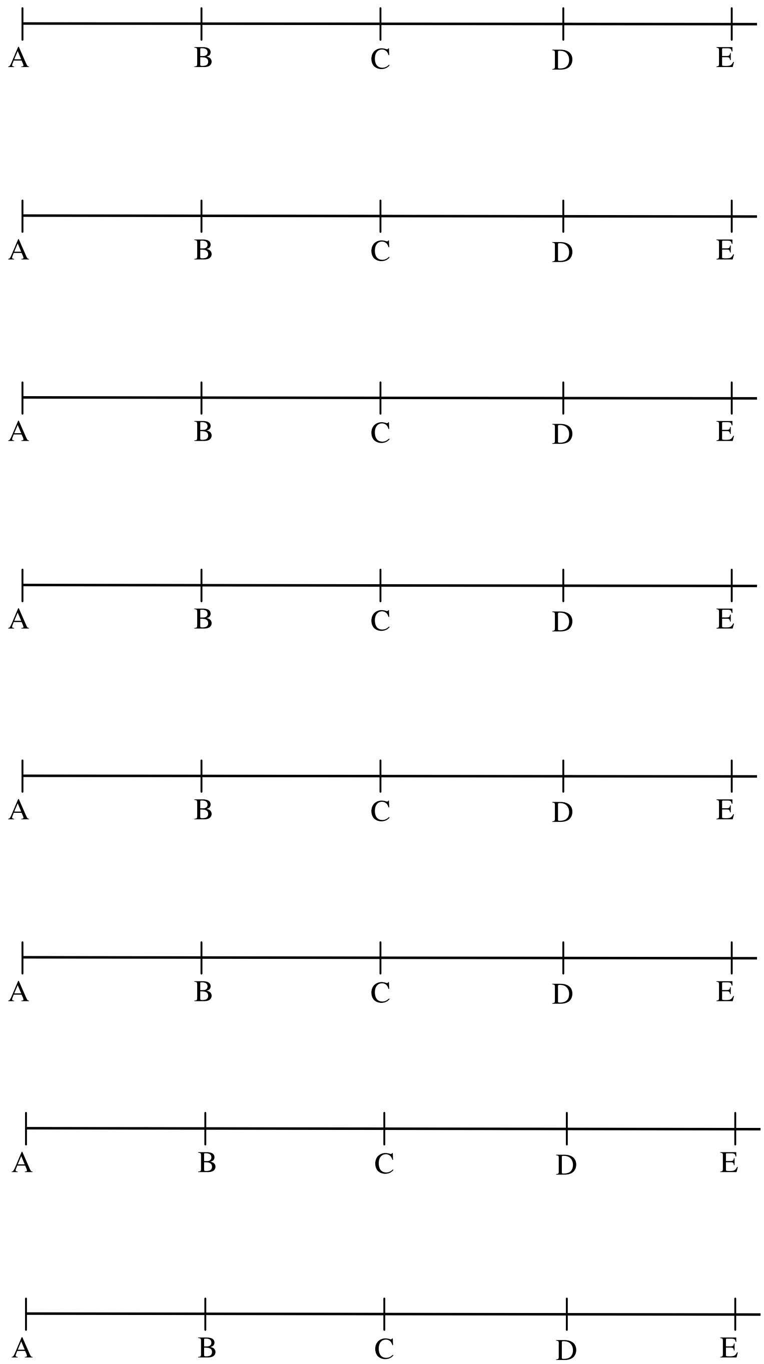
2. Referring to Figure I, draw the influence lines for $\boldsymbol{R_A}$, $\boldsymbol{R_B}$, $\boldsymbol{M_A}$, $\boldsymbol{M_B}$, $\boldsymbol{M_C}$, $\boldsymbol{V_A}$, $\boldsymbol{V_B}$, and $\boldsymbol{V_C}$. Draw in the order which you find appropriate. *(35 points)*

Calculations and Diagrams:



Calculations and Diagrams (cont'd):

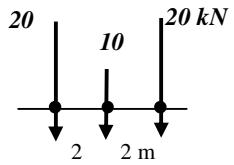
Calculations and Diagrams (cont'd):

3. Let w_D**=10 kN/m** (dead load); w_L**=10 kN/m** and P**=20 kN** (live loads)
   - Compute the maximum value(s) for R_A and V_C, and show the corresponding loading position (s). *(10 points)* ☐
   - Compute R_A for w_L on BCD only and P on B and D and compare with question 1 (do not include w_D). *(5 points)* ☐

Calculations and Diagrams:

Calculations and Diagrams (cont'd):

4. Compute the maximum value(s) of M_C for the truck load shown below, and show the corresponding position(s) of the truck. *(10 points)*
   Compute the maximum absolute moment that can ever occur between B and D for the truck load shown below. Compare with maximum M_C and briefly comment *(10 points)*



Calculations and Diagrams:

EXTRA SHEET 1: Continued from page _____

Name: _____ **ID#:** _____

Calculations and/or Diagrams:

EXTRA SHEET 2: Continued from page _____

Name: _____ **ID#:** _____

Calculations and/or Diagrams: