# Quiz. 2 <br> Spring 2014-2015 

(April 15, 2015)
CIVE210 - STATICS CLOSED BOOK, 1 HR 15 Minutes

## Name:

ID\#: $\qquad$

## NOTES

- 3PROBLEMS- 13 PAGES.
- ALL YOUR ANSWERS SHOULD BE PROVIDED ON THE QUESTION SHEETS.
- TWO EXTRA SHEETS ARE 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.
- QUESTION SHEETS SHOULD BE RETURNED.


## YOUR COMMENT(S)

DO NOT WRITE IN THE SPACE BELOW

## MY COMMENT(S)

## YOUR GRADE

| Problem I: | $---/ 25$ |
| :--- | ---: |
| Problem II: |  |
| Problem III: | $---/ 25$ <br> $---/ 50$ |
| TOTAL: | $/ 100$ |

## Problem I: (25 points)



Figure I

Two members $\boldsymbol{A D}$ and $\boldsymbol{C E}$ are connected by a pin at $\boldsymbol{C}$. A cable connects $\boldsymbol{B}$ to $\boldsymbol{E}$. The supports are a pin at $\boldsymbol{A}$ and a roller at $\boldsymbol{D}$. The applied force on the system is a concentrated force of 1000 N . Determine all the actions that act on the element $\boldsymbol{A B C D}$ and draw the F.B.D of this element showing only positive values and positive directions. All dimensions shown are in meters.

Calculations and/or Diagrams:
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## Problem II: (25 points)



## Figure II

A rigid steel frame system is subjected to the forces and couple shown in Figure II.

1. Reduce the system of forces sand couples shown in Figure II to a single resultant force and single resultant moment at the support $\boldsymbol{A}$. (17points).
2. Based on Part 1, it is required to reduce the resultant force and resultant moment to a single resultant force located on the line $\boldsymbol{A B}$. Determine the location of this resultant force on $\boldsymbol{A B}$ measured from $\boldsymbol{A}$. (8 points)
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## Problem III: (50 points)



(+) Convention

Figure III
For the beam shown in Figure III:
1- Compute the reactions at supports B and D. (7 points)
2- Using the method of SECTIONS, compute the shear force and bending moments at points $\boldsymbol{A}, \boldsymbol{B}, \boldsymbol{C}, \boldsymbol{D}$ and $\boldsymbol{E}$. Draw the necessary Free body diagrams.(18 points)
3- Select a proper origin, and draw the Shear force and Bending moment diagrams for the whole beam using the method of EQUATIONS, confirm your results obtained in part 2. (Use the space provided below for the diagrams and draw to scale as much as you can). Show the important and necessary features and values on the diagrams and indicate the maximum positive and negative shears and moments in the beam. (25points)

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## EXTRA SHEET 1: Continued from page

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Calculations and/or Diagrams:

# EXTRA SHEET 2: Continued from page 

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