# QUIZ 1 <br> Fall 2016-17 <br> (Monday October 24, 2016) <br> CIVE210 - STATICS <br> CLOSED BOOK, 1 HR 30 MN 

Name: $\qquad$ ID\#: $\qquad$ Sec: $\qquad$

## NOTES

- 3 PROBLEMS- 12 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.
- 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

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\text { Problem I: } \quad \__{\text {_ _ }} / 20
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Problem II: $\quad-\quad-\quad / 45$
Problem II: _ _ _ $/ 35$
Bonus/Extras - Organization, Neatness, Special, ...:

-     -         - 


## Problem I: (20 points)



Figure I
Tick Boxes to check that you solved all questions

The pipe system shown in Figure I, subjected to two forces at point A and supported at point O, is in equilibrium.

1. Determine the magnitude and direction of the resultant force at point A . What is the resultant force at point O. ( 10 points)
2. Compute the moment about point O . What is this moment at point A ? (10 points)

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## Problem II: (45 points)



Figure II
The rigid pipe system is subjected to the forces and moment shown in Figure II. Note that EC is in a vertical plane parallel to XZ , the 160 N is a force in this plane and is perpendicular to EC , and the 25 degrees angle is a vertical angle.

1- Determine the equivalent resultant force (Express in Cartesian vector form, and calculate its magnitude and direction). (13 points)
2- Determine the magnitudes of the projected component of the resultant force on $A B$ and $A E$. (7 points)
3- Using whichever method you wish, or a combination of methods, compute the moment produced by the applied loads (forces and moment) at point A (Express in Cartesian form, and calculate its magnitude and direction). Draw it as best as you can as a "vector" on the figure above. (18 points)
4- Determine the component of this moment about an axis extending between points A and C . (magnitude only). (7 points)

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## Problem III: (35 points)



## Figure III

A system of cables suspends a crate weighing $\mathrm{W}=390 \mathrm{lb}$ as shown in Figure III. Note that DCAB is in the vertical plane XZ, and ECF is in the vertical plane YZ, and "think" before you solve.

Determine the force in the cables $\boldsymbol{A B}, \boldsymbol{A C}, \boldsymbol{C D}, \boldsymbol{C E}$, and $\boldsymbol{C F}$.
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