QUIZ 2
Spring 2002-2003
(Thursday, May 15, 2003)
CIVE 311 – STRUCTURES I
CLOSED BOOK, 1 ½ HOURS

Name: _____ **ID#:** _____

NOTES

- 2 PROBLEM - 10 PAGES.
- ALL YOUR ANSWERS SHOULD BE PROVIDED ON THE QUESTION SHEETS.
- **ONE EXTRA SHEET 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.

YOUR COMMENT(S)

_ _

_ _

DO NOT WRITE IN THE SPACE BELOW

MY COMMENT(S)

_ _

_ _

YOUR GRADE

Problem I: _ _ _ /75
Problem II: _ _ _ /25
Other: _ _ _
_____

TOTAL: /100

Problem I: *(75 points)*

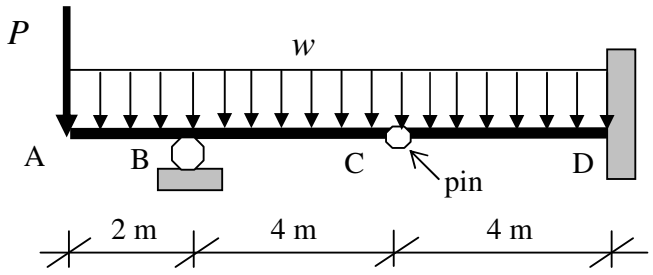


Figure I

Referring to Figure I, let ***EI*=100,000 kN.m^2** throughout the beam. Neglect the own weight of the beam.

USE THE MOMENT-AREA METHOD THROUGHOUT THIS PROBLEM.

1. Let ***w*=20 kN/m** and ***P*=50 kN**
   Compute the slope at C (θ_C) and the vertical deflections at A and C (v_A and v_C) (*40 points*). Indicate where the maximum downward deflection will occur between B and D and explain. (*10 points*)
   NOTE: You can calculate slopes and deflection in whichever order you find suitable.

   Calculations and Diagrams:

Calculations and/or Diagrams (cont'd):

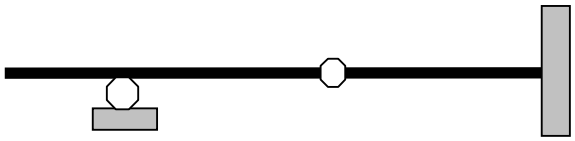
Calculations and/or Diagrams (cont'd):

Calculations and/or Diagrams (cont'd):

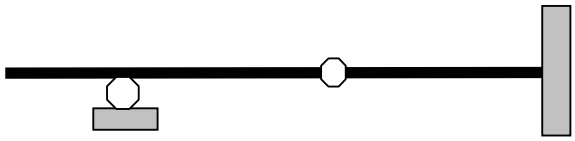
2. Let ***w*=20 kN/m**, and ***P*** gradually increased from 0 to 200 kN (very large value). As best as you can, sketch the expected deflected shapes of the beam for the sequence of ***P*** as shown below (NO CALCULATIONS). (*15 points*)

Deflected Shapes:

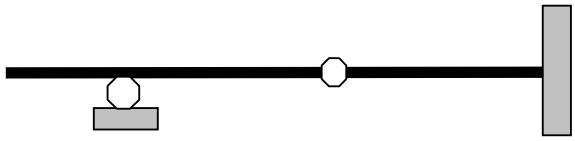
P=0 kN



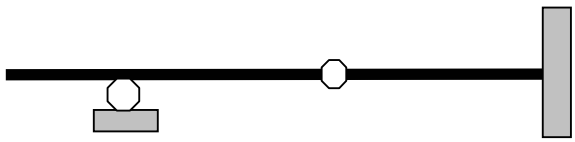
P=25 kN



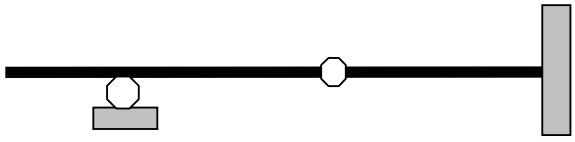
P=50 kN



P=100 kN



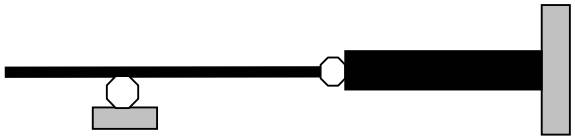
P=200 kN



3. Let ***w*=20 kN/m** and ***P* =50 kN**
   Assuming member CD to be very stiff, sketch the expected deflected shape of the beam. Can this beam analyzed using a simpler model? Show this model. (NO CALCULATIONS) (*10 points*)

   Deflected Shapes:

CD very stiff



Your simplified model ----------

Problem II: *(25 points)*

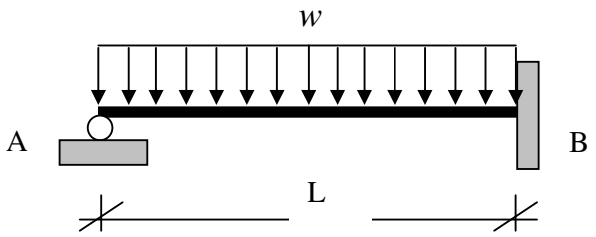


Figure II

The beam shown in Figure II is indeterminate to the first degree. Neglect the own weight. A measuring device indicated that an inflection point (zero curvature) exists at (*3L/4*) from A. Use this information to solve the problem (find reactions, draw shear and bending moments, and sketch deflected shape).

Calculations and Diagrams:

Calculations and Diagrams (cont'd):

EXTRA SHEET: Continued from page _____

Name: _____ **ID#:** _____

Calculations and/or Diagrams: