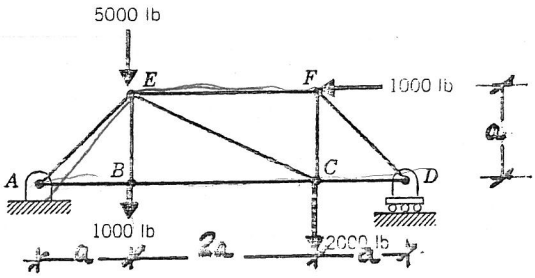
CONCORDIA UNIVERSITY

Faculty of Engineering and Computer Science
ENGR 242/2 Statics, Section V
Test #3

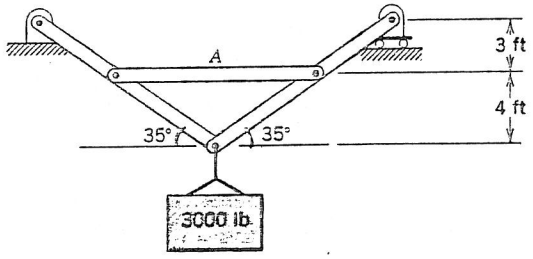
Attempt all questions, only calculators permitted TIME: 60 Minutes

MARKS

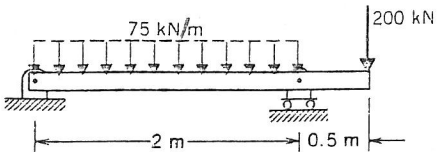
35 1) In the truss shown, evaluate the axial forces of members EB, EC and FC. Indicate whether these members are under tension or compression.



30 2) Neglecting the mass of the structure, evaluate the forces in the member A.

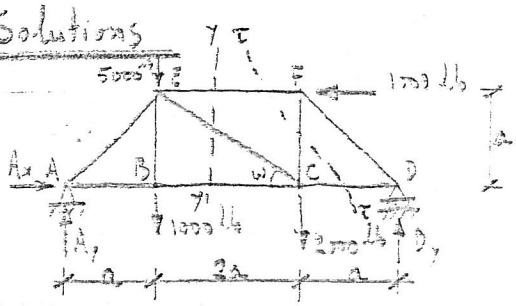


35 3) Sketch the shear force and bending moment diagrams for the beam shown. Indicate peak values.



ENGR 242/2 Section V Test #3 Solutions

1) From equilibrium of joint B: $S_{EB} = 1500$ lb (T)



Entire truss: $\Sigma M_A = 0 = D_y \times 4a + 1000\,a - 6000\,a - 2000 \times 3a$

$\therefore D_y = 2750$ lb

Section zz: $\Sigma F_y = 0 = S_{EC} - D_y \quad \therefore S_{EC} = 2750$ lb (T)

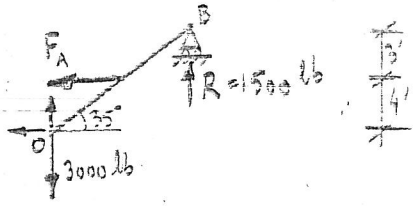
$w = \tan^{-1}\frac{1}{2} = 26.57°$

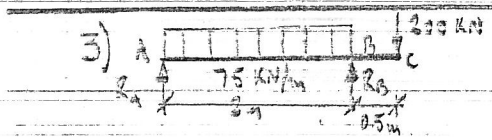
Section yy: $\Sigma F_y = 0 = S_{EC}\sin w + 2750 - 2000 \Rightarrow S_{EC} = -1677.3$ lb (C)

2) From symmetry or moment equilibrium: $R = 1500$ lb.

$(\Sigma M)_O = 0 = F_A \times 4 + 1500 \times 7 \tan 55°$

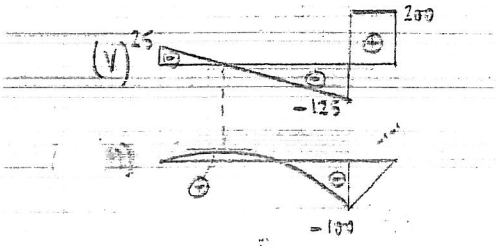
$\therefore F_A = -3749$ lb (Compression)



3) 

$\Sigma M_A = 0 = R_B \times 2 - 200 \times 2.5 - 75 \times 2 \times 1 \Rightarrow R_B = 725$ kN

$\Sigma F_y = 0 = R_A + 725 - 200 - 75 \times 2 \Rightarrow R_A = 25$ kN



$V_B^l = 25 - 75 \times 2 = -125$ kN

$M_B = 25 \times 2 - 75 \times 2 \times 1 = -100$ kN·m

PLEASE LEARN FROM YOUR MISTAKES !!!