

# CONCORDIA UNIVERSITY

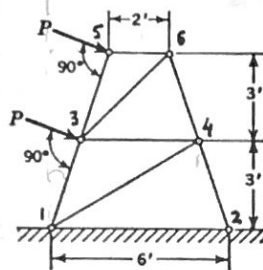
Faculty of Engineering and Computer Science  
ENGR 242/4 Statics, Section J  
Test #3

**MARKS**

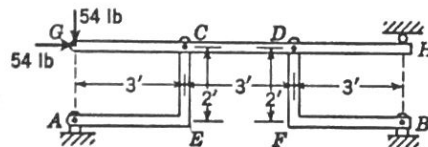
Attempt all questions; only calculators permitted

TIME: 60 minutes

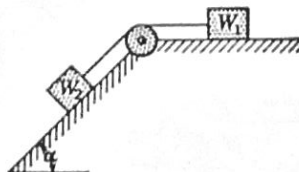
- 30 1) For the truss shown and the given loading, determine the axial forces in members 3-4 and 6-4. Indicate whether these members are in tension or compression.



- 35 2) Calculate the horizontal and vertical components of the reactions at the supports A, B and H of the frame structure loaded as shown.



- 35 3) Two rectangular blocks of weights  $W_1$  and  $W_2$  are connected by a flexible cord and rest upon a horizontal and an inclined plane, respectively, with the cord passing over a pulley as shown. In the particular case where  $W_1 = W_2$  and the coefficient of static friction  $\mu$  is the same for all contiguous surfaces, find the angle  $\alpha$  of inclination of the inclined plane at which motion of the system will impend. Neglect friction in the pulley.



RECALL:

$$\sin \alpha = 2 \tan \frac{\alpha}{2} / (1 + \tan^2 \frac{\alpha}{2})$$