

Name (print): _____

Table _____ Group _____

Honor Code: *I have neither given nor received unauthorized aid
on this test*

Signature: _____

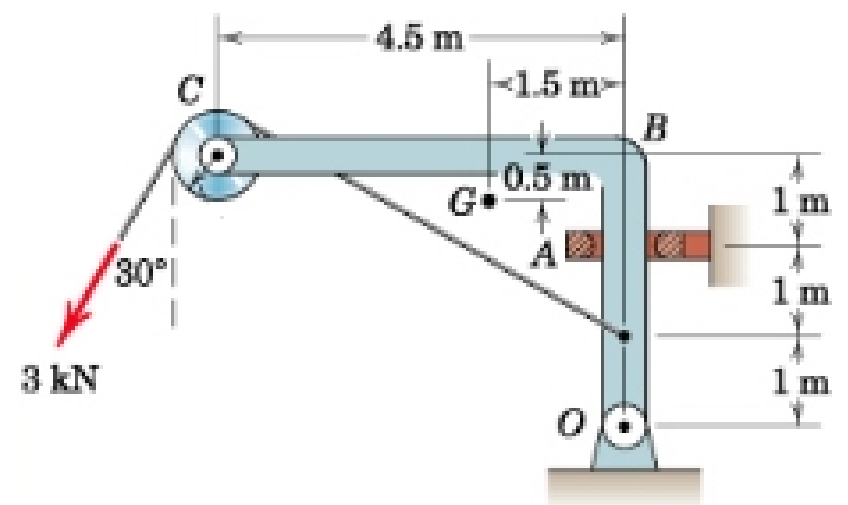
ME 201 Test #1

Spring, 2007

NOTES:

- *Sign and provide identifying info on every sheet.*
- *Use proper vector notation in all cases where vectors are used.*
- *In cases involving Newton's Laws, you are **REQUIRED** to draw complete and correct **FBDs** and when the problem is dynamics, you must also draw complete and correct **KDs**. Then use these to develop your governing equations.*
- *If you use you calculator to perform any calculus that might involve trig or similar functions, set your calculator to the radian mode first.*
- *In all cases, remember to show results with magnitude, direction, units and put your answer in a box.*

1. (20 pts) The member OBC and pulley at C together have a mass of 500 kg, with a combined center of mass (center of gravity) at G . The size of the pulley is negligible compared to the other dimensions. The collar at A can provide support only in the horizontal direction and contacts the member on one side or the other. Calculate the reaction forces at the collar A and at the frictionless pin connection at O when the 3-kN load is applied.



2. (20 pts) The force P is applied to the 200-lb block A which rests atop the 100-lb crate. The system is at rest when P is first applied. The dimensions of the block and crate are negligible. Determine the forces between A and B and at the bottom of the crate B if (a) $P = 60$ lb, (b) $P = 80$ lb, and (c) $P = 120$ lb. If either body is not in equilibrium in either of the three load cases, calculate the accelerations of the bodies.

