name and student-identification number

Possibly useful facts:
Gravitational acceleration near earth’s surface \( g = 9.8 \text{ m/s}^2 \approx 10 \text{ m/s}^2 \).
Gravitational force between bodies of masses \( m_1 \) and \( m_2 \) a distance \( r \) apart is \( Gm_1m_2/r^2 \).
1-dim. pos. as func. of time \( t \) with init. vel. \( v_0 \) & const. accel. \( a \) is \( x(t) = (1/2)at^2 + v_0t + x_0 \).
In same circumstance, velocity is \( v(t) = at + v_0 \).
Acceleration needed to keep a body moving in a circle of radius \( r \) at speed \( v \) is \( v^2/r \).
A mass \( m \) moving with velocity \( v \) has kinetic energy \( mv^2/2 \) and momentum \( mv \).

Moments of inertia \( I \) of some objects of mass \( M \) and circular cross-section of radius \( R \), each about an axis through the center and perpendicular to the cross-sectional area: hoop or thin-walled cylinder, \( MR^2 \); uniform cylinder or disk, \( (1/2)MR^2 \); uniform sphere, \( (2/5)MR^2 \).
Rotational kinetic energy at angular frequency \( \omega \) is \( (1/2)I\omega^2 \). The torque exerted by a force \( F \) through a moment arm \( R \) about an axis is \( F_R = FR_\perp = FR\sin \theta \).
Bernoulli’s equation says that, on a given streamline in an incompressible liquid, \( P + (1/2)\rho v^2 + \rho g y \) is a constant, where \( P \) is pressure, \( \rho \) density, and \( y \) the height above some reference point.

ANSWER ONLY EIGHT OF THE TEN PROBLEMS. To indicate the problems you prefer not to answer, leave them blank or cross out the answer areas. If you answer nine or ten problems, the last one or two will not be marked. **YOU MUST SHOW ALL WORK, EVEN ON MULTIPLE-CHOICE PROBLEMS.**
The quiz is graded out of 80 (but will be normalized to 100 when final grades are calculated). Each question is worth 10 points. Grade cutoffs (see syllabus): A−=70, B−=55, C−=40. Partial credit is possible (but not guaranteed) on the short-answer questions. A homework bonus of up to 8 points (10%) will be added to your score.