Jashore University of Science and Technology

B.Sc. Engineering in Petroleum and Mining
Second semester of First year
Course no.: PHY 1201
Course title: Physics (Properties of Matters)
Assignment no.: 01
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1. When a car stops suddenly, the passengers tend to move forward relative to their seats. Why? When a car makes a sharp turn, the passengers tend to slide to one side of the car. Why? [4]

2. A crate with mass 32.5 kg initially at rest on a warehouse floor is acted on by a net horizontal force of 140 N. (a) What acceleration is produced? (b) How far does the crate travel in 10.0 s? (c) What is its speed at the end of 10.0 s? [4]

3. A 68.5-kg astronaut is doing a repair in space on the orbiting space station. She throws a 2.25-kg tool away from her at 3.20 m/s relative to the space station. With what speed and in what direction will she begin to move? [4]

4. An airplane propeller is rotating at 1900 rpm (rev/min). (a) Compute the propeller's angular velocity in rad/s. (b) How many seconds does it take for the propeller to turn through 35°? [4]

5. A 2.00-kg rock has horizontal velocity of magnitude 12.0 m/s when it is at point P (as in the figure given below). (a) At this instant, what are the magnitude and direction of its angular momentum relative to point O? (b) If the only force acting on the rock is its weight, what is the rate of change (magnitude and direction) of its angular momentum at this instant? [4]