ISP209 Spring 2002 **Homework 13** Name: _____
Due: Tues., Apr. 25, 2:40 pm, in Rm 118PA. ID:_____

1. In your own words, explain why a person *feels* weightless in a space station orbiting the earth.

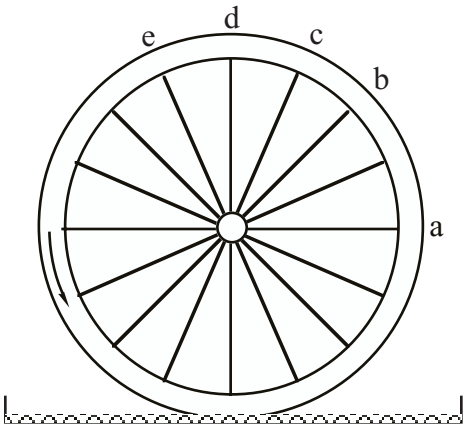
2. Explain why one feels heavier than normal at the *lowest* point in the motion of both an UP and a DOWN elevator. While you are at it you can also explain why one feels lighter than normal at the *highest* point in the motion of both an UP and a DOWN elevator.

3. Which statement is true about gravity?
   (a) The larger of two masses affected by gravity has the larger acceleration.
   (b) There is no gravitational force on an astronaut in orbit.
   (c) The Earth's gravitational force alone cannot be felt by a human being.
   (d) The gravitational force between two masses is linear in the separation distance.
   (e) The Earth's gravitational force is zero on a mass on the dark side of the moon.

4. How heavy do you feel in an elevator moving downward at 5m/s that stops in 0.5 sec?

a) 20% heavier b) 20% lighter c) 50% heavier d) 50% lighter e) twice as heavy

5. A wheel shown at the right is turning rapidly in a shallow pan of water and throws water droplets off at various points around the circle. At which point is a drop released from the wheel if its initial motion is straight upward?
   (a) , (b) , (c) , (d) , (e)



Wheel turns in a shallow pan of water.

6. When a moving mass hits a spring attached to a wall it compresses the spring. Which statement below is false:
   a) the magnitude of the force on the wall is the same as the magnitude of the force on the mass.
   b) the mass is compressed where it touches the spring
   c) the mass will have an acceleration during the compression.
   d) the magnitude of the force on the mass is the same as the magnitude of force on the spring
   e) the mass has a uniform compression force within it.

7. The net force acting on a person is non-zero in which case below?
   a) falling at a constant velocity.
   b) lying on a soft mattress.
   c) lying on a bed of 10,000 nails.
   d) floating on the water in a pool.
   e) none of the above.