Phyx 135-1 Semi-Pop Quiz #2 **Name** _____

_____ **1)** An object which is moving in a circle at constant speed is experiencing:

A) Zero acceleration and a constant velocity.
B) Zero acceleration and a constantly changing velocity.
C) Non-zero acceleration and a constant velocity.
D) Non-zero acceleration and a constantly changing velocity.

D – The fact that the object is changing directions means it must have a changing velocity. And if the velocity is changing, then it must be under acceleration.

_____ **2)** I am whirling a ball of mass "m" around my head. The tension in the string that is acting on the ball is:

A) Equal to mv^2/r and always directed inwards.
B) Equal to v^2/r and always directed inwards.
C) Equal to mv^2/r and directed along the path of the ball.
D) Equal to v^2/r and directed along the path of the ball.
E) Equal to mv^2/r and directed outwards.

A – Tension always pulls, so the tension on the ball must be towards the inside. And the magnitude of the force for circular motion is always mv^2/r.

_____ **3)** You are in a car racing around a circular track. You are leaning against the outward-facing door when it suddenly pops open. You will:

A) Move straight outward, away from the center of the track.
B) Move on a curving line inwards.
C) Move in a straight line tangential to the circular track.
D) Move in a curving line that begins on a tangential to the track.
E) Move outward and forward in a curving motion.

C – An object with no force acting on it must move in a straight line. Since your original velocity was tangential to the circular track, your motion after you are let loose will be also.

_____ **4)** The entity that we call "centrifugal force":

A) Is a real force that can be seen by all observers in all frames.
B) Pushes everything away from the center of a rotating frame.
C) Is a real force, but it only exists inside rotating frames.
D) Pulls everything on a tangential line around a circle.
E) Is a pseudo-force that only seems to exist depending on your viewpoint.

E – To a person *inside* a rotating frame, the relative motion between the frame and your tendency to move in a straight line produces what seems to be a "force" that is trying to move you *away* from the axis of rotation. However, this is an illusion. To a person *outside* the rotating frame, the only force acting on you is whatever tension/friction is keeping you moving in a circle. Thus centrifugal force is a pseudo-force that depends on your point of view.

_____ **5)** Which of the following statements is *false*? When solving a problem with a rotating object, the centrifugal force:

A) Can be resolved into vectors like any other force.
B) Cannot be resolved into vectors.
C) Can be considered to act directly away from the axis of rotation.
D) Can always be assigned a magnitude of mv^2/r.
E) Can be used so long as the mass continues to rotate in a circle.

B – One of the reasons we call centrifugal force a "pseudo-force" is precisely because it can be resolved into vector components, just like a real force.