Advanced Physics I   **Final Exam Review**   Name_____

1. The mass of a proton is now known to be 1.672650×10^{-27} kg. Express the mass to four significant figures.
   a.   1.672
   b. $1.6E^{-27}$
   c. $1.672E^{-27}$
   d.   other _____

2. The speed of sound in air is about 331 m/s at 100^oC. Convert this to yards per minute.
   a.   362
   b.   19860
   c.   21700
   d.   other _____

3. An electron moving in a straight line has an initial speed of 3.00×10^5 m/s. It undergoes an acceleration of 8.00×10^3 m/s^2 for 10.0 s. How far will it have traveled in this time?
   a.   3.40E6
   b.   4.03E7
   c.   4.00E8
   d.   other _____

4. An arrow can fly at 111 miles per hour on a calm day. It is shot due north into a steady wind of 25.0 miles per hour due east. What is the arrow's resultant velocity?
   a.   114 mi/hr 12.7^oEN
   b.   228 m/s 25.4^oNE
   c.   114 mi/hr 12.7^oWS
   d.   other _____

5. A cannon fires a 6.00kg ball at 42° from the ground with a velocity of 57.0 m/s. How far away does it hit the ground?
   a.   -7.78
   b.   330
   c.   7.78
   d.   other _____

6. A 10.0-kg object on a 10.0^o slope undergoes an acceleration of .50 m/s^2. What is the coefficient of friction?
   a.   .12
   b.   .24
   c.   .48
   d.   other _____

7. Find the tension in the two wires that support 75.0-N light fixture. Each wire makes a $25.0°$ angle from the ceiling.
   a.   75.0
   b.   7.65
   c.   88.7
   d.   other _____

8. Find the work done by a man as he pushes on a crate at 35.0° from the horizontal with 50.0 Newtons. The crate is moved 10.00 meters.
   a. 500
   b. 410
   c. 290
   d. other _____

9. A roller coaster rolls down a curved track starting from point A 50.0 m in the air with zero velocity. If the track is frictionless, find the speed at 30.0 m high.
   a. 19.8
   b. 38.6
   c. 80
   d. other _____

10. A 75.0 kg skateboarder is moving 2.5 m/s north when he tosses his 10.0 kg book bag at 1.0 m/s to a friend standing directly in front of him. What is the skateboarder's new velocity?
    a. 2.2
    b. -2.7
    c. 2.7
    d. other _____

11. A DVD is spinning at a at 135 rpm's. If the player has an acceleration of -1.5 rad/s^2 after pushing the stop button, how long should you wait for it to stop spinning?
    a. 94
    b. 9.4
    c. 21.
    d. other _____

12. Batman (90.0 kg) and Robin (70.0 kg) are about to swing on the 30.0 m batrope together. The rope is attached to a pipe 30.0 m away and level with the caped crusaders. The manufacture's warning states that the rope should not exceed 1620 N. What is the margin of safety for the dynamic duo?
    a. -3070
    b. 52
    c. -1570
    d. other _____

13. A 1500 kg car is parked 25 m from the west end of a 100.0 m bridge that has a mass of 1.00×10^4 kg. What is the upward force on the end of the east end of the bridge?
    a. 11270
    b. 14700
    c. 490365

14. A phonograph turntable (I= 2.5×10^{-2} kgm^2) spins freely at 45 rev/min. If 10 - .050kg records with a diameter of 15.0cm drop down the spindle onto the turntable, what is the new rate of rotation?
    A. 6.0rad/s   B. 3.85rad/s   C. 40rad/s   D. 600rad/s