



MIGHTY PHYSICS



BLITZ Ch 7

PRINT NAME _____ Period _____

*** You MUST USE INK, Use no “is when's” and it's “separate”.

*** You may use your notes, but no help from others.

EXPLAIN IN COMPLETE SENTENCES AND GIVE EXAMPLES:

1. Describe Gyroscopic Inertia and Precession.
2. Elaborate on centrifugal and centripetal effects and their causes.
3. Tell about Inertial and Non-inertial Frames of Reference.
4. Explain the cause of the conservation of rotational inertia of the Merry-go-round trick (everyone climb inward!).
5. State Newton's Law of Gravity and give an example.

SHOW METHOD OF SOLUTION for the problems (The 1,2,3,4,5).

6. A 0.500 kg brass weight is swung horizontally at the end of a cord 1.25 m long at the rate of 1.50 revs/sec . Calculate the centripetal force it.
7. An object weighing 10.0 n is swung in a vertical circle. The diameter of the circle is 2.20 m. Find the critical velocity (orbital) at sea level?
8. A rotating disk starts from rest. If it is subjected to an angular acceleration of 2.5 rad/s² for 7.5 s, what angular velocity in rev/s is achieved?
9. Using the formula for The Law of Gravity ($F = GMm/d^2$) and the formula for The Centrifugal Effect ($F_C = mv^2/r$), show why the mass of a satellite does not affect its orbit. Remember that $F_{(grav)} = F_{(cent)}$ when in orbit.
10. A 5.00 kg cannon ball is separated from a 10.00 kg cannon ball by 2.00 m between their centers. Find the gravitational attraction between them.

FORMULAS (the text may be used for more formulae):

$$T = 1/2\pi r^2 \alpha \quad \alpha = \text{rad/s}^2 \quad V_{\text{crit}} = \sqrt{rg} \quad \omega_f = \alpha \Delta t \quad F_C = mv^2/r$$

$$1 \text{ rev} = 2\pi \text{ rad} \quad \omega = \Delta\phi/\Delta t \quad F = GMm/d^2 \quad G = 6.67 \times 10^{-11} \text{ N}\cdot\text{m}^2/\text{kg}^2$$