

Assignment 2: (Spring 2010)

PHYSICS (PHY101)

TOTAL MARKS: 20

Due Date: 10/05/2010

DON'T MISS THESE *Important instructions:*

- To solve this assignment, you should have good command over first 12 lectures.
- Upload assignments properly through LMS, (No Assignment will be accepted through email).
- Write your ID on the top of your solution file.
- All students are directed to use the font and style of text as is used in this document.
- Don't use colorful back grounds in your solution files.
- Use Math Type or Equation Editor etc for mathematical symbols.
- This is not a group assignment, it is an individual assignment so be careful and avoid copying others' work. If some assignment is found to be copy of some other, both will be awarded zero marks. It also suggests you to keep your assignment safe from others. No excuse will be accepted by anyone if found to be copying or letting others copy.
- **Don't wait for the last date to submit your assignment.**

Q 1:

Which could potentially cause you the greater injury; being tackled by a light-weight, fast-moving football player, or being tackled by a player with double the mass but moving at half the speed?

Marks = 5



Q 2:

For each situation, state whether the collision is elastic or inelastic. If it is inelastic, state whether it is completely inelastic or not?

- a) You drop a ball from your hand. It collides with the floor and bounces back up so that it just reaches your hand.
- b) You drop a different ball from your hand and let it collide with the ground. This ball bounces back up to half the height from which it was dropped.
- c) You drop a ball of clay from your hand. When it collides with the ground, it stops.

Marks = 5

Q 3:

Will the centre of mass in Fig, 1 continue on the same parabolic trajectory even after one of the fragments hits the ground? Why or why not? **Marks = 5**

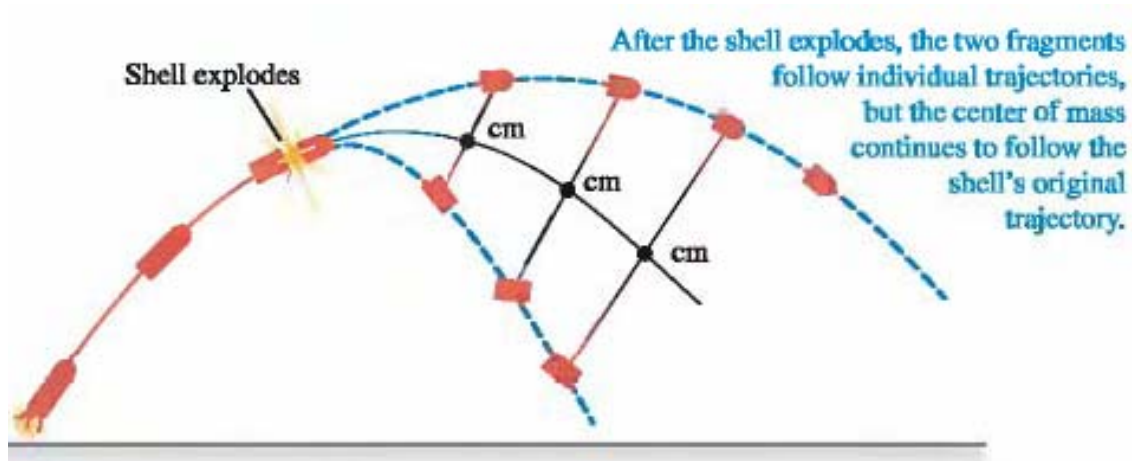


Fig 1. A shell explodes into two fragments in flight. If air is ignored, the centre of mass continues on the same trajectory as the shell's path before exploding.

Q 4:

- (a) If a rocket in gravity-free outer space has the same thrust at all times, is its acceleration constant, increasing or decreasing?
- (b) If the rocket has the same acceleration at all times, is the thrust constant, increasing or decreasing? **Marks = 5**

.....Good Luck.....