

Physics-306

Homework Set (3)

This set is due by Thursday 28th of Jumada-I, 1436 (19th of March, 2015) at 10.00 p.m. (*).

In *all homeworks*, please solve *fully* and *clearly*, *state assumptions*, and *comment* wisely (when applicable).

Please circle your final answer.

Feel free to study from books, and discuss with your instructor, but do *not* consult others (colleagues, professors, electronic forums...etc.) for this problem set!

I wish you well, wa assalam alaikum!!

Zain Yamani
Phys-306 Instructor

(*) slip it under my Office door, in 15-3100

Question-1:

In clear succinct verbal statements, describe the conservation laws studied in chapter-8. State these laws in mathematical terms, defining the different physical quantities.

Question-2:

Imagine a very long solenoid with radius R , n turns per unit length, and current I . Coaxial with the solenoid are two long cylindrical shells of length L -one inside the solenoid at radius “ a ”, carries a positive charge Q , uniformly distributed over its surface. The other, outside the solenoid at radius “ b ”, carries a charge $-Q$, uniformly distributed. The current in the solenoid is gradually reduced, and the cylinders begin to rotate.

Describe qualitatively and quantitatively how the “total” angular momentum is conserved.

Question-3: Griffith Problem 8.2