Physics-306
Homework Set (6)

This set is due by Thursday 18th of Rajab, 1436 (7th of May, 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, or discuss with colleagues.

I wish you well, wa assalam alaikum!!

Zain Yamani
Phys-306 Instructor

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

Question-1: Qualitatively explain why the daylight sky is blue.

Question-2: Griffith Problem 11.14.

Question-3: At synchrotron radiation facilities, charged particles move at relativistic speeds in circular orbits. [This is a simplified picture, ignoring wigglers and other effects]

a- Find the angular distribution of radiation due to the circular motion of charged particles.

b- Use a computer to plot the radiation distribution when:

   i. $v/c = 0.6$, and

   ii. $v/c = 0.9$

c- Look up what a typical orbit radius of such a facility is, and calculate the total power radiated due to the acceleration of electrons for the two cases in part-b, above.

Question-4: Use the dumbbell model used your textbook to explain the Abraham-Lorentz formula for radiation reaction force (to within a factor of 2). That is, it is sufficient here to reach (Eqn. 11.99)