!"#$%&'(%)*+,-%./,0%%%%%%%%Thursday,	
  April	
  23,	
  2015	

	

Take-‐home	
  exam.	
  Duration:	
  24	
  hours.	
  You	
  may	
  use	
  Jackson	
  and	
  one	
  other	
  EM	

textbook.	
  You	
  may	
  consult	
  your	
  written	
  course	
  notes	
  and	
  the	
  course	
  webpage.	
  You

(1 point) For the problem above, at the specified coordinate and time, does the

“radiation field” dominate or does the “Lorentz--‐transformed Coulomb field”

dominate, if you wanted to determine . and 2 fields? Note: don’t spend time
evaluat ing . and 2!

4. (5 points) A relativ istic electron (charge –e) incident on an atomic nucleus

(charge +Z) is accelerating towards the nucleus (being attracted to it), makes its closest approach (at a distance b), and then flies off, moving on a hyperbolic

path. Don’t worry too much about the details of the hyperb olic path.

At the point of closest approach, the electron has tota l energy E. What is the total

instant aneous power – write the