Exam Report

Module Code/Title: PHYS2001/Electromagnetism

Module Leader: Prof S F King

Many of you did well, more than 30% of you achieved a first-class mark. The exam paper was not quite easy so those who did well has demonstrated their good knowledge of physics, that they worked hard and should be proud by themselves.

Section A

A1. Well done by almost all the students. They have properly understood and explained charge density and volume current density and have performed the respective calculations.
A2. In this question I have noticed common problem: the students wrote correctly the connection between C, Q and V but but many of them had a problem on derivation of the electrostatic energy stored in the capacitor which required taking an integral of V as a function of Q.
A3. Most of the students properly successfully solved this problem demonstrating the knowledge of Gauss's divergence theorem and connection of non-zero divergence of magnetic filed B with the magnetic monopoles.
A4. Generally well done: most of the students has explained well the meaning of the Poynting's vector and have performed the calculation of the Poynting's vector. The common problem for some students, though, was the quotation of the wrong units for Poynting's vector.
A5. Usually well answered for both, magnetic field and the current density
which has demonstrated good knowledge of the differential form of the Maxwell equations for the magnetic filed

Section B

B1. a),b) i-iii were generally well answered, while almost everybody has failed to completely solve b) iv. The main problem was the lack of understanding for most of the students the definition of the potential and the limits for the respective integration.
B2. Most of students did well part a), though some students did not clearly and correctly have drawn the respective figure. Part b) was slightly problematic for some students, especially for those who did not draw the correct figure which was crucial to solve the problem successfully.
B3. a) was done successfully by most of students as well as b) did not caused much problems, while c) was problematic for more than half of students who has chosen this question -- the common mistake was in the incorrect formulas for the incident, transmitted and reflected electric and magnetic fields.
B3. a) and b) was done well by most of the students, while c) caused some trouble for about third of students chosen this question and did not do math properly.