Examination Feedback for EEE6084 – Applied Electromagnetics
Spring Semester 2011-12

Feedback for EEE6084 Session: 2011-2012

Feedback: Please write simple statements about how well students addressed the exam paper in general and each individual question in particular including common problems/mistakes and areas of concern in the boxes provided below. Increase row height if necessary.

General Comments:

Q1 very unpopular, meaning that vast majority of candidates did Q2, 3 & 4.

Question 1:

Poorly answered and unpopular question.

(a) Bookwork. One or two managed an augmentation to Ampere's Law, but how this satisfied Kirchoff's continuity relation was lost.
(b) Again, the wave and diffusion equations eluded most.
(c) Hardly any managed correct numerical solutions. Some incorrectly made skin depth a function of permittivity.

Question 2:

Generally well answered.

(a) Most gave correct formulae for these, although one or two used Cartesian differential components rather than the ∇^2 formulation.
(b) Most managed the two stage integration to potential and obtained the correct constants from the boundary conditions, but some repeated the procedure for each half of the junction to get the total voltage which was unnecessary – just x2. Not many correctly sketched the potential variation, making errors with axis calibration or shape of distribution.
(c) Some were confused about the junction width and 'a' (the half – width) and had errors by a factor of two in calculations.

Question 3:

Generally well answered. Popular mistakes:
a) Many didn't identify *sin(5x + 8t)* as representing wave.
b) Velocity often wrong – students forgot to divide through by *t* multiplier.
c) The question asked for 'all resistive, capacitive and inductive components' of lossless/lossy transmission lines. Many students assumed just one of each type, thus omitting *G* (conductance).
d) Many students started derivation by plucking equation for β^2 out of thin air. Many also failed to justify the use of binomial expansion.
e) Just one student noticed that the approximation in *d)* was not valid in *e)*. This was an error in the paper, though I do not consider that it was a hindrance. Many of the remaining students erroneously equated wavelength with propagation distance.
f) Generally OK.

Question 4:

Generally well answered. Popular mistakes:
a) Some students got field directions back to front.
b) Some failed to distinguish between μ, μ_r and μ_0.
c) Generally OK.
d) Quite a few students used wrong units.
e) Not many good answers to this. Lots of students tried to write equations for *V* & *I*, rather than *E* & *H.*
f) Plenty of trouble sketching the *E* and *H* fields.
g) A few failed to mention the direction of *ExH* vector.
h) Generally OK.