Examination Feedback for EEE6120 – Modelling of Machines
Spring Semester 2012-13

Feedback for EEE6120 Session: 2012-2013

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:

Performance on this paper was generally very good. There were several instances overly rough rounding up and down applied in some solutions which then led to some spread in the final numerical values – three significant figures is usually a good starting point for problems which are fully specified numerically, whereas 2 significant might be more reasonable for values derived from graphs.

Question 1:

The theory section which fronted the question was generally done well. The problem section was not straightforward in terms of the route to the solution but the vast majority of students did well. There were cases of confusion around the route to calculating efficiency.

Question 2:

In the theory section several students did not read the question properly and proceeded to provide a full derivation of the equivalent circuit, working the derivation well beyond the point at which they were asked to stop. (No marks were awarded or deducted for this additional unnecessary effort). The main sections of the calculations on the induction machine were done well, although several students made errors in the calculation of the rotor copper loss. Calculating the no-load current caused problems, with several students attempting to combine the magnetising reactance and the core loss resistor into a single impedance, with some unfortunately treating them as if they were series connected elements. The most straightforward method is to simply add the currents (while remembering that phase is critical!) and not go down the route of a combined impedance.

Question 3:

Some poor attempts at plotting graphs, e.g. no labeling of axes, pitiful attempts to make use of the full extent of the graph paper (e.g. crowding the graph into a small corner). Despite labouring the point in lectures about ensuring that radians are used in formulae, several students still used degrees, ending up with torque values that were out by a factor of just over 10. Several students struggled with the last section on airgap change which presumably stems from it being rather different in nature from questions posed previously. For those who remained composed and thought about it, the correct solution is remarkably straightforward.

Question 4:

Fewer students attempted this than the other questions but those who attempted it generally did well. As is often the case with questions looking for the calculation of the number or turns or the length of the airgap, several students made errors in terms of deciding how many turns drive the flux across how many airgaps. This said, the majority of marks were awarded if the method used was correct.