

Examination Feedback for EEE305/EEE6140 – Machine Design
Spring Semester 2012-13

Feedback for EEE305/EEE6140 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:

Overall both the BEng and MSc students performed very well.
The students have mastered those contents in the lecture or lecture notes, but still have serious problems in applying the knowledge learnt to a specific application, e.g. even when the slot is rotated by 90 degrees, the mistake was made for inductance calculation (question 3(a)), for magnet flux focusing a general complex derivation was used (question 4(b)), and for winding factor (question 2(a)) general expression for conventional windings cannot be applied but the students were still deriving the general expression.

Question 1:

A lot of students make mistake on question 1(a). Actually, it is very simple and almost a lecture note work. Most students confused brushless AC machines with brushed DC machines!

The answer to 1(b) should be from the emf and current, not from the Lorenx force, otherwise, this question would be the same as 4(a).

Question 2:

For 2(a) a lot of students also answered that relevant to Fig. 2(b). This is not required. If it is answered, no extra mark will be given. Fig.1 (b) is only used in question 2(d).

For 2(b), it is important that the winding factors should be specifically associated with Fig.1(a). A lot of students only derived the general expression of winding factors and hence full mark is not given.

For 2(c), the key point is that you need to consider the winding factors for the harmonics.

Question 3:

For 3(a), the key point is that if you would like to utilize the symmetry, b_0 should be halved.

It is very interesting to note that a lot of students confused with height and width in the inductance calculation (swapped!). This is probably simply due to the fact that in the lecture, slot is placed vertically, but in Figure 2 it is horizontally!

For 3(b), the PM needs to be treated as air. Hence, the equivalent slot opening is 4mm.

Question 4:

For 4(b), only open circuit airgap field is required to derive. Almost all students derived from the general case (with current excitation!).