

Feedback for EEE6003 Session:2007-2008

General Comments:

Overall the paper was poorly attempted and it was quite obvious that many students had not spent anywhere near enough time on independent study for the module. The vast majority of the questions were based on the lecture notes and handouts and followed a similar format to past exams. There were a worryingly large number of students who seemed not to have read the questions carefully, missing parts out and answering questions which had not been asked. Another common problem was that many students failed to show intermediate steps in arriving at their final answer with the result that it was difficult to award part marks for questions where the final answer was incorrect.

Question 1:

Attempted by about 75% of candidates. Common mistakes in part (a) was to confuse the formula for the electric field with that for force on a point charge. Some students calculated the individual components but did not give the resultant force. Part (b) was reasonably well attempted, but a common error was to omit to express the area of the capacitor in terms of its actual dimensions. There was a small error in the way the question was phrased as the dielectric constants were relative values, although students should have realized this from the numerical values and lack of units. Part (c) (i) was well answered although several candidates omitted to multiply by 4 for the 4 sides of the square. (c) (ii) was not so well answered with many candidates making many changes and crossings out before quoting the final answer given on the question paper (presumably in the hope of gaining marks by confusing the examiner!). Very few candidates answered part (c) (iii) in which they should have realised that n tends to infinity.

Question 2:

Part (a) was very poorly answered despite being based on very simple equations for a transformer. Many students simply added the quoted values for the resistance together rather than referring the secondary resistance to the primary. Only a handful of candidates obtained the correct answer for (a)(ii) – most used the no-load current rather than obtaining the full-load current from the VA rating quoted. Again in part (a)(iii) candidates used the VA rating rather than the voltage rating. On the whole part (b) was better attempted perhaps because it was similar to a class example and a question from a previous year's exam. Most candidates managed part (b)(i) correctly although some forgot to refer the speed through the gearbox or did not know how to convert from degrees to radians. A common mistake on part (b)(ii) was to use the incorrect time for the acceleration and deceleration periods (using the full 3 seconds rather than the correct 0.5 seconds. Only a handful of candidates tried the last part of the question and generally gave the correct answer.

Question 3:

Answers to this question, particularly part (a) were disappointing. Common mistakes were as follows:-
(a) (i) Several students tried (unsuccessfully) to draw complete circuits of logic gates for the flip-flops – this was not what the question asked for. Some students only considered JK flip-flops and ignored the reference to SR flip-flops altogether. Some students gave truth tables for AND gates, not flip-flops!
(ii) Many students tried to draw circuits for counters which were not ripple counters. No student attempted to make the straight-forward modification from the count-down counter seen in the notes to a count-up counter as referred to in the question.
(iii) Many students failed to answer this part, and where they did, answers were poor. The answer is straight out of the notes, and is fundamental to ripple counters.
Part (b) was generally tackled better by most students. Of the students who made a reasonable attempt at this part the only common mistake was always falling back to the first state if an out-of-sync bit is received. If a '0' bit is received when a '1' bit is expected then the system should revert back to the second state as the '0' forms the first bit of the sequence it is trying to detect.

Question 4:

Answers to part (a) (i) were very poor – students showed little understanding of what “entropy” means. Many students simply stated the equation and gave no explanation whatsoever.

Part (a) (ii) was answered much better with the majority of students successfully applying the Huffman technique. Quantitatively showing the performance increase gained using the Huffman coding was sadly not so good.

It was evident in part (b) that many students had simply tried to memorise the notes on multiple access communication systems without achieving any level of understanding, thus many of the descriptions were very poor. Some students could not remember what multi access meant and described things like modulation techniques instead.