

淡江大學八十八學年度碩士班招生考試試題

系別：電機工程學系

科目：計算機概論

本試題共 / 頁

1. (40%) Explain the following terminologies or questions:
 - (1) the 5 phases in an instruction cycle
 - (2) hit ratio
 - (3) 3 commonly used DMA techniques
 - (4) *race condition* in a sequential logic circuit
 - (5) recursion
 - (6) Give one famous method for generating random number by computer
 - (7) Moore's Law
 - (8) NP-complete
2. (10%) What is the purpose of *interrupt*? When interrupted, what operations should the CPU do?
3. (10%) What is the meaning of RISC? List at least 4 basic policies of RISC.
4. (10%) Use the Huffman code technique to compress the following message (Note that a space is also a character):

A SIMPLE STRING TO BE ENCODED USING HUFFMAN CODE

Please give the "Huffman tree" for the above message.
5. (10%) Design and give a logic circuit of the BCD (Binary-Coded Decimal) adder.
6. (10%) In the 2's complement addition or subtraction, suppose that overflow has not occurred then the carry-out can always be ignored. Please prove this result. (Note that a numerical example CANNOT be accepted as a proof!)
7. (10%) To be a good or at least qualified researcher, you must have the ability to think carefully before you taking any action on one topic. This includes to find a *good* and *new* topic or to identify an already existing problem being crucially important but not yet been noticed. Please give an example of either (i) *advanced* application of computer network in the future or (ii) extremely crucial problem to be studied of computer network. You should give *technical reasons* for your proposal. Try your best to complete the answer within 10 lines. (Note that only NEW idea will be accepted!)