1. (10%) Translate each of the following binary representations into its equivalent base representation. To get full credit, please also list the process.
   (a) \((101100)_2 = (\quad)_{16}\) (5%)
   (b) \((0.001)_2 = (\quad)_{10}\) (5%)

2. (10%) What do CISC and RISC stand for? Compare and contrast CISC architecture with RISC architecture, and then give an example for each of them.

3. (10%) List four conditions that lead to deadlock in a computer system.

4. (10%) Answer the following questions.
   (a) What is a proxy server and what are its functions? (5%)
   (b) Similarly, what does DNS stand for, and what function does it provide? (5%)

5. (10%) Let a half adder be expressed as follows, construct a full adder using this building block.

   ![Half Adder Diagram]

6. (25%) Explain the following terms.
   (a) Cache memory (5%)
   (b) Algorithm (5%)
   (c) Computer virus (5%)
   (d) Phishing (5%)
   (e) Compiler (5%)

7. (15%) Consider the sequence: 3, 1, 4, 7, 5, 8, 6, 2.
   (a) Insert, into an initially empty binary search tree, numbers of the sequence (in the order). Draw the binary search tree after these insertions. (5%)
   (b) What will be the output of in-order traversal of the tree obtained in (a)? (5%)
   (c) What are the advantages and disadvantages of an array-based representation for a binary tree? (5%)

8. (10%) Consider the sequence 38, 41, 52, 75, 22, 13, 84, 63 using insertion sort. Show the list at the end of each pass.