1. What is the value of the 8-bit binary quantity 10101000 if it is interpreted a) as an unsigned integer (2%), b) as a signed integer represented in sign/magnitude notation? (4%)

2. Assuming that x = 1 and y = 2, find the value of each of the following Boolean expressions:
   (a) (x = 1) AND (y = 3) (2%)
   (b) (x < y) OR (x > 1) (2%)
   (c) NOT [(x = 1) AND (y = 2)] (2%)

3. Answer the following questions:
   a. What are the major differences between a time-sharing and a client/server environment. (5%)
   b. What are the major components of a computer system. (5%)
   c. What are the basic steps in the system development life cycle (10%)
   d. Describe the concept and characteristics of object-oriented programming. (10%)

4. What is a "breadth first search"? (3%) Write an algorithm to find a node in a graph. (8%) Give an example to illustrate the algorithm. (4%)

5. Describe the operation logic of "bubble sort". (8%)

6. What is B-tree? (5%) Build a B-tree of order 3 after inserting 12, 32, 2, 22, 7, 27, 1, 18 (5%) What will be the B-tree if we delete 27, 18, and 12 from the B-tree. (5%)

7. Explain the following terms: (20%)
   a. eBusiness
   b. Enterprise Resource Planning (ERP)
   c. Product Data Management (PDM)
   d. Supply Chain Management (SCM)
   e. Knowledge Management (KM)