1. (a) Explain the relationships between time-sharing and multi-tasking from
the perspective of how Web server operates.  (4%) 
(b) Use an example to illustrate an object class and an object instance.  (3%) 
(c) Explain the advantages and disadvantages of a programming language
which provides dynamic memory allocation.  (4%) 

2. Suppose that you are shopping around on the Internet.
(a) Design a linked-list data structure to store all the product-items you
have purchased. Each node in the linked list should store the
information of a purchased item, including the item’s name, unit_price
and no_of_units.  (4%) 
(b) Write a recursive algorithm to compute the total money you spent.  (10%) 

3. Explain the concept of foreign key in database systems.  (4%) 

4. Explain the concept of interleaved concurrency  (4%) 

5. Explanation:  (25%) 
(a) Garbage collection. 
(b) B-tree 
(c) Topological order 
(d) Linear probing 
(e) Stack and Queue 

6. Write the prefix and postfix for A/B**C +D*E-A*C (infix).  (8%) 

7. Explain the following terms.  (20%) 
(a) Shareware 
(b) RISC 
(c) Client/server model 
(d) CD-RW drives 
(e) GUI 

8. Write a binary search program in any programming language.  (14%)