

1. Explain the following abbreviations/terms: (25%)
 - a. ERP
 - b. SCM
 - c. BOM
 - d. Meta-data
 - e. Schema (in database)
2. Convert (1) $8D_{16}$ and (2) 41_{16} to their equivalent base eight notations. (6%)
3. The sequential search is used with a list of n items. What is the (1) least, (2) maximum, and (3) expected number of comparisons the search will take? (9%)
4. What is the minimum depth of a binary tree that contains n nodes. (6%)
5. For an undirected graph, G , with n vertices and e edges, show that
$$\sum_{i=0}^{n-1} d_i = 2e, \text{ where } d_i = \text{degree of vertex } i. \text{ (10\%)}$$
6. Write a recursive program to compute the length of a linked-list. (12%).
7. Draw a binary tree T with 9 nodes. The inorder and preorder traversals of T yield the following sequences of nodes: (10%)

Inorder: EACKFHDBG
Preorder: FAEKCDHGB
8. A company stores parts in several warehouses, each under the management of a manager, before sending them as they have been ordered by customers. Try to convert the above statement into an Entity-Relationship (ER) model (10%)
9. A shop floor is equipped with machines ($M1, M2$ etc.) of different types and robots ($R1, R2$, etc.) for transferring parts from one machine to another. Each machine has its own input queue ($Q1, Q2$ etc). A robot unloads parts from a machine and transfers them to the input queue of another machine. Assume the robot is much faster than the machines so that no output queue is necessary for the machines.

Try to convert the statement into an object-oriented model (12%)