



注意事項：

1. 答案依序書寫於答案卷上，不必抄題。
2. 答案卷不可書寫任何可辨別個人姓名或特殊標記，違者不予計算。
3. 請於試題紙上填寫准考證號碼，繳卷時「試題」、「答案卷」一併繳回。

1. (1) Describe the Depth First Search (DFS) algorithm, which traverses nodes in a graph. In addition, describe the data structures that may be used in the algorithm.
(2) How to use the DFS algorithm to find the connected components of a graph?
2. Please design four equal size subnets from 101.101.101.64/26.
3. Assume we have a list of numbers 38,17,42,72,27,43,55,48,66 to be sorted. Use Quick sort to sort the list in ascending order. Write in detail each step of the sorting process.
4. Explain and describe “ROLLBACK”, “ROLLFORWARD”, and “COMMIT” with an example.
5. Please give and compare functions provided by hub, bridge, switch and router.
6. What are the advantages and disadvantages of using the same system-call interface for manipulating both files and devices?
7. In **Figure 1**, use Prim algorithm to draw the minimum cost spanning tree and calculate the minimum cost.

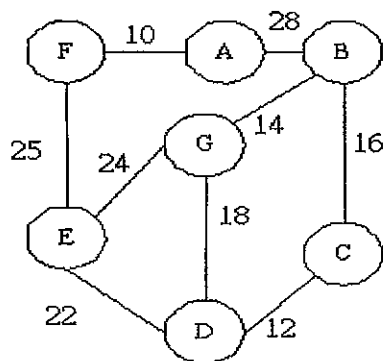


Figure 1

8. What are Prufer sequences? Given a Prufer sequence, design an algorithm to construct a undirected tree.
9. Given a set of n points in the plane. Design an algorithm to determine whether there exist four points in the set that are vertices of a square.
10. Find the optimal order, and its cost, for evaluating the product $A \times B \times C \times D \times E$, where $A: 10 \times 2$, $B: 2 \times 5$, $C: 5 \times 2$, $D: 2 \times 5$, $E: 5 \times 20$