

國立高雄大學 101 學年度研究所碩士班招生考試試題

科目：資料結構
考試時間：100 分鐘

系所：資訊管理學系(乙組)
本科原始成績：100 分

是否使用計算機：否

1. Explain following terms: (10%)

- (a). Divide & Conquer
- (b). Euler Trail
- (c). Bipartite Graph
- (d). AVL Tree
- (e). NP Complete

2. Please list the order in Figure 1. which vertices are traversed by using (a) *Depth-First Search* and (b) *Breadth-First Search*, respectively. Assume the search starts from vertex A. (10%)

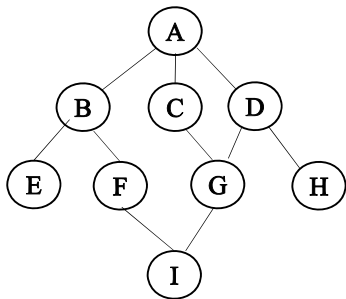


Figure 1

3. Please construct (a) *Binary Tree* (b) *Max Heap Tree*. Show the resulting from the insertion of the following sequence of numbers: (10%)

37, 76, 11, 65, 17, 82, 31, 70, 19

4. Please write a program to construct:

- (a). Declare a structure of *Circular Linked List*, and implement the following functions of *insert_fornt*, *delete a node* and *search a key*(10%)
- (b). Using the result of (a), to construct a *Stack* (5%)
- (c). Using the result of (a), to construct a *Queue* (5%)

5. Please write a pseudo code algorithm for manipulating graphic. Such a collection should allow input arbitrary graphs

- (a). *Minimum Cost Spanning Trees*.(5%)
- (b). *All Pairs Shortest Paths*.(10%)
- (c). Analyze (a) and (b) the time complexity of the algorithm (5%)

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6. Consider the Figure 2, answer the following question:

- (a). Find the corresponding *Adjacency Matrix A* (5%)
- (b). Find the *Transitive Closure Matrix A** (10%)
- (c). Find the *Reflexive Transitive Closure Matrix A⁺* (5%)

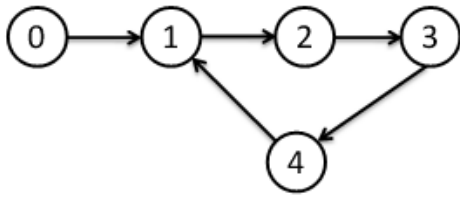


Figure 2

7. Please change the *Infix* expression: $A * B + C / D$ to other expressions

- (a). *Postfix* (5%)
- (b). *Prefix* (5%)