

國立高雄科技大學 108 學年度碩士班 招生考試 試題紙

系所別： 電機工程系碩士班

組別： 丙組

考科代碼： 1065

考科： 資料結構

注意事項：

- 1、各考科一律可使用本校提供之電子計算器，**考生不得使用自備計算器**，違者該科不予計分。
- 2、請於答案卷上規定之範圍作答，違者該題不予計分。
- 3、本試題共 7 題，共 100 分。
- 4、考生作答前請詳閱答案卷之考生注意事項

1. Please sort time complexity from **fast to slow** of following Big-Oh notations. $O(\log n)$, $O(n)$, $O(n^k)$, $O(2^n)$, $O(n!)$, $O(n \log n)$, $O(n^2)$ (10%)
2. Please answer the following questions. (10 %)
 - (a) What is minimum and maximum nodes in a complete tree with height of 10? (5%)
 - (b) What is maximum leaf nodes in a binary tree with height of 9? (5%)
3. The inorder and preorder traversal of the tree are shown below. Please draw the binary tree. (10%)
 - (a) Preorder JCBADefIGH (5%)
 - (b) Inorder ABCEDfJGIH (5%)
4. Suppose we are to sort a list of 10 records with keys (26, 5, 37, 1, 61, 11, 59, 15, 48, and 19). Please show the process of **quick sort** step by step. (20%)
5. Please convert the **infix expressions to postfix** expressions (20%)
 - (a) $((A/(B-C+D))*(E-A)*C)$. (10%)
 - (b) $(((((A/B)-C)+(D*E))-A*C))$ (10%)
6. Please build the **Binary Search Tree** according to following data: (10%)
20, 16, 30, 22, 28, 18, 10, 21
7. Assuming the $F_n = (0, \text{ if } n=0$
1, if $n=1$
2, if $n=2$
 $F_{n-1} + F_{n-2} + F_{n-3}, \text{ if } n>2)$
Please write down the **recursive code** and **to find the F_8** : (20%)