

科目：資料結構與演算法

適用：資工系

考生注意：

1. 依次序作答，只要標明題號，不必抄題。
2. 答案必須寫在答案卷上，否則不予計分。
3. 限用藍、黑色筆作答；試題須隨卷繳回。

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1. a. How many different binary trees can be made from 5 nodes?
Explain your answer. (20%)
b. Suppose a binary tree is used to store N nodes, show the possibly minimum tree height. Explain your answer. (10%)
2. For the following key sequence,
“ADIAMOND IS FOREVER”,
a. create a 2-3-4 tree. Explain your answer in detail. (15%)
b. draw a red-black tree to represent your 2-3-4 tree in the previous question. (15%)
c. explain the structural properties of the red-black trees. (15%)
3. For an AVL tree, write a C-like pseudo-codes to determine which one of the R-R, L-L, R-L, L-R rotations should be perform. Explain your answer briefly. (25%)

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