

國立彰化師範大學105學年度碩士班招生考試試題

系所： 電子工程學系(乙組選考丁)、
資訊工程學系(選考甲)、
資訊工程學系積體電路設計碩士班(選考丁)

科目： 資料結構

☆☆請在答案紙上作答☆☆

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1. If a tree has a node of degree one, two nodes of degree two, three nodes of degree three....., n nodes of degree n, how many leaf nodes are there in this tree? (25%)
2. The recursive formula for binomial coefficient is $C_k^n = C_{k-1}^{n-1} + C_k^{n-1}$, for all integers $n, k > 0$, with boundary values: (25%)
 $C_0^n = 1$, for all integers $n \geq 0$,
 $C_k^0 = 0$, for all integers $k > 0$,
 $C_n^n = 1$, for all integers $n \geq 0$
Write a *recursive* function `int cnk(int n, int k)`, which computes and returns the binomial coefficient C_k^n .
3. Read the following data in the given order, and show the corresponding trees. (25%)
11, 15, 27, 22, 6, 19, 31, 37, 17, 25, 2, 33, 8
(1) Binary search tree
(2) AVL tree
4. Please write an algorithm to invert a singly linked-list pointed by pointer p. (25%)