所別：企業管理學系碩士班 企業電子化戊組(一般生)　科目：計算機概論　共 2 頁 第 1 頁

本科考試禁用計算器

＊請在試卷答案卷（卡）內作答

【第一部份：計算機理論基本觀念選擇題。共 45 分】

- 以下共有 15 題選擇題，每題最多有一個正確答案。請選出各題的正確答案，若題中所列選項皆不正確請回答「×」。
- 答對每題得 3 分，答錯每題倒扣 1 分。

1.1 Considering the data structure, which statement is wrong? (A) a queue can be implemented as an array, (B) a binary tree is normally implemented as an array, (C) a stack is normally implemented as a linked list (D) a queue can be implemented as a linked list.

1.2 A control bus with eight wires can define _____ operations. (A) 8, (B) 16, (C) 256, (D) 512.

1.3 _____ is a multiprogramming method in which multiple programs are entirely in memory with each program occupying a contiguous space. (A) Partitioning, (B) Paging, (C) Demand paging, (D) Demand segmentation.

1.4 In two's complement addition, if there is a final carry after the leftmost column addition, _____. (A) add it to the leftmost column, (B) add it to the rightmost column, (C) increase the bit length, (D) discard it.

1.5 In _____ sort, the smallest item moves to the beginning of the unsorted list. There is no one-to-one swapping. (A) quick, (B) bubble, (C) insertion, (D) selection.

1.6 _____ can occur when a process has too many resource restrictions. (A) Deadlock, (B) Synchronization, (C) Starvation, (D) Paging,

1.7 _____ between modules in a software system must be maximized. (A) Coupling, (B) Cohesion, (C) neither A nor B (D) A and B.

1.8 The _____ is a pointer that identifies the next element in the linked list. (A) link, (B) node, (C) array, (D) all of above.

1.9 The push operation _____ of the stack. (A) deletes an item from the top, (B) deletes an item from the bottom, (C) inserts an item at the top, (D) inserts an item at the bottom.

1.10 _____ encoding is a lossless data compression method. (A) Huffman, (B) Run-length, (C) LZ, (D) all of the above.

1.11 In the system development process, structure charts are tools used in the _____ phase. (A) analysis, (B) design, (C) testing, (D) all of the above.

1.12 The digital signature method does not provide _____. (A) confidentiality, (B) authentication, (C) integrity, (D) nonrepudiation.

1.13 We use brute-force search: (A) if we have no prior knowledge about the search, (B) if we need to do the search quickly, (C) if we need to do the search thoroughly, (D) after performing the heuristic search.

注意:背面有試題

參考用

1.14 Which number representation method is often used to store the exponential value of a fractional part? (A) unsigned integers, (B) two's complement, (C) Excess system, (D) none of the above.

1.15 In the _____ hashing method, selected digits are extracted from the key and used as address. (A) direct, (B) division remainder, (C) modulo division, (D) digit extraction.

【第二部份：簡答題。共 25 分】

2.1 **(5 Points)** A computer has a monoprogramming operating system. If the size of memory is 64MB, and the operating system automatically allocates 10MB of memory to data and the memory-resident part of the operating system needs 4MB, what is the maximum size of program that can be run by this computer?

2.2 **(5 Points)** If there are 16 nodes to be stored in a binary tree, what is the minimum height of the tree? Please give your answer and reason.

2.3 **(5 Points)** If you have a square room with a computer in each corner, which topology needs less cabling? Please jive your answer and reason. (A) a bus LAN, (B) a ring LAN, (C) a star LAN with a hub at the center of the room.

2.4 **(5 Points)** "A binary search is always faster than a linear search". Do you agree the statement? Please give your answer and reason.

2.5 **(5 Points)** Please give an example to explain the concept of divide-and-conquer algorithm.

【第三部份：計算機程式、資料結構與演算法。共 30 分】

3.1 **(10 Points)** A binary tree has 10 nodes. The inorder and preorder traversal of the tree follow. Please draw the tree.

Preorder: JCBADEFIGH
Inorder: ABCEDFJGIH

3.2 **(10 Points)** Please write an algorithm in pseudocode for the selection sort using two nested loops.

3.3 **(10 Points)** The Euler's number e can be approximated using the following formula:

$$e = 1 + \frac{1}{1!} + \frac{1}{2!} + \frac{1}{3!} + \frac{1}{4!} + \frac{1}{5!} + \ldots\ldots + \frac{1}{(n-1)!} + \frac{1}{n!}$$

Please write an algorithm that approximate e using a loop that terminates when the difference between two successive values e differ by less than 0.0001.

注意：背面有試題

參考用