

國立臺中教育大學 99 學年度大學日間部轉學招生考試

計算機概論試題

適用學系：資訊科學學系、數位內容科技學系

一、單選題：20%

1. 做為 CPU 和主記憶體緩衝的是 (A) 虛擬記憶體 (B) 快取記憶體 (C) 唯讀記憶體 (D) 次記憶體
2. 以下哪一個時間複雜度最高？ (A) $O(n^2)$ (B) $O(2^n)$ (C) $O(\log n)$ (D) $O(n!)$
3. 可以用內容定址的是 (A) 快閃記憶體 (B) 靜態記憶體 (C) 關聯記憶體 (D) 次記憶體
4. 下列何者是外部排序？ (A) 插入排序 (B) 氣泡排序 (C) 快速排序 (D) 合併排序

二、問答題：(80%)

1. 系統軟體主要包括那幾種軟體？試分別說明之。(10%)
2. 簡單說明何謂固態儲存裝置(Solid State Storage Device)並舉出兩個實例。(4%)
3. 以下為一部份的 C 程式，請問當執行時，會列印出什麼結果？(10%)

```
int num[2][4]={11, 13, 15, 17, 19, 21};  
int *p = &num[1][0];  
printf("%d\n",*p++); -----(1)  
printf("%d\n",*++p); -----(2)  
printf("%d\n",*(p-=3)); -----(3)  
printf("%d\n",*p--); -----(4)  
printf("%d\n",*--p); -----(5)
```
4. 在 C++ 語言中，請簡短解釋何謂建構者(Constructor)?何謂解構者(Destructor)? (6%)
5. 請說明 IEEE 802.11 所規範的三種傳輸技術。(10%)
6. 請說明 ARP 協定的用途。(5%)
7. What is the purpose of a database model? (5%)
8. What advantage does public-key encryption have over more traditional encryption techniques? (10%)
9. Please write down the definition of the Moore's Law. (10%)
10. Please write down the pseudocode of the binary search algorithm. (10%)

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離散數學試題

適用學系：資訊科學學系二、三年級

1. Suppose that the domain of the propositional function $P(x)$ consists of the integers 5, 6, 7, and 8. Express each of the following statements without using quantifiers, instead using only negations (\neg), disjunctions (\vee), and conjunctions (\wedge).
 - (1) $\exists x P(x)$ (5%)
 - (2) $\neg \forall x P(x)$ (5%)

2. How many ways are there to distribute 8 indistinguishable (identical) balls into 5 distinguishable bins? (10%)

3. Find the solution to $a_n = 7a_{n-2} + 6a_{n-3}$ with $a_0 = 9$, $a_1 = 10$, and $a_2 = 32$. (10%)

4. Let R be the relation on the set $\{0, 1, 2, 3\}$ containing the ordered pairs $(0, 1)$, $(1, 1)$, $(1, 2)$, $(2, 0)$, $(2, 2)$, and $(3, 0)$.
 - (1) Find the reflexive closure of R . (5%)
 - (2) Find the symmetric closure of R . (5%)

5. What is the minimum number of students required in a class to guarantee that at least 15 students will receive the same grade, if there are 5 possible grades, A, B, C, D, and F? (10%)

6. For the prefix code given in Figure 1, please decode the sequence 1001111101. (15%)

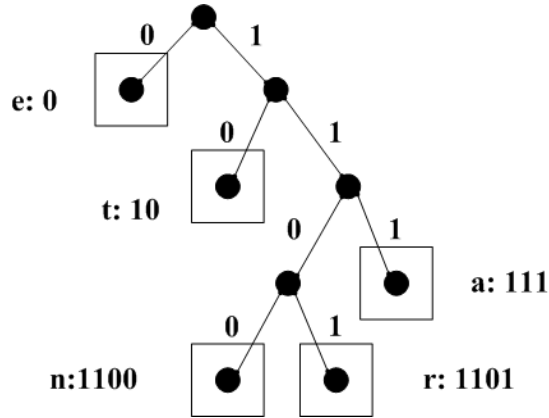


Figure 1

7. Please find a Hamilton cycle if one exists, for the graph or multigraphs in Figure 2. If the graph has no Hamilton cycle, determine whether it has a Hamilton path. (15%)

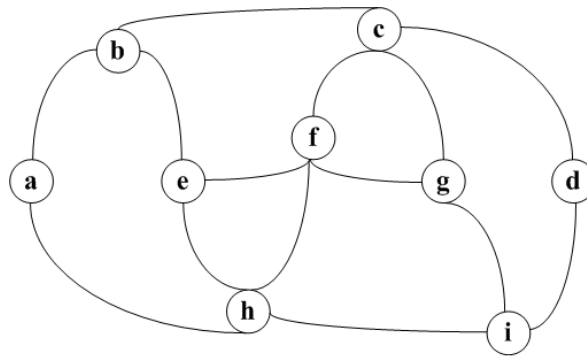


Figure 2

8. Please find the minimal spanning tree by applying Kruskal's Algorithm to the graph shown in Figure 3. Also, please write down the weight. (20%)

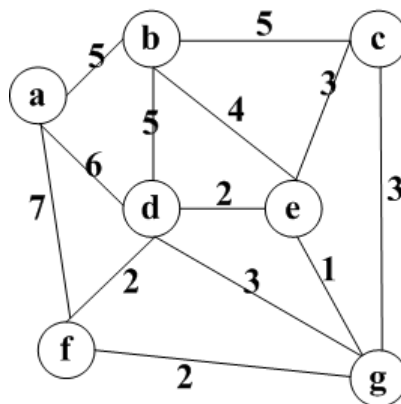


Figure 3