國立中央大學 108 學年度碩士班考試入學試題

所別： 企業管理學系 碩士班 企業電子化與大數據戊組(一般生)
企業管理學系 碩士班 企業電子化與大數據己組(一般生)

科目： 計算機概論

本科考試禁用計算器

I. 選擇題 (每題 3%, 共 15%)

1. 給定一程式碼如下，請問螢幕上會印出?

```
void func (int i) {
  i+=3; }
void main( ) {
  int i = 2;
  func (i);
  printf("%d\n", i); }
```

(A) 3 (B) 2 (C) 5 (D) 7

2. 已知 int num[3][3]={1,2,3,4,5,6,7,8,9} 請問 *(*(num+1)+2); 指的是哪個值?
(A) 3 (B) 4 (C) 5 (D) 6

3. 下列哪一個格式字串可以顯示小數點下 6 位的浮點數值？(A) %6d (B) %10.6d (C) %.6f (D) %6.3f

4. 以下的程式中 do ... while 迴路會執行幾次?

```
int n=0;
do {
  if ( n>5 ) break;
  n+=2;
  } while(1);
```

(A)2 (B)3 (C) 4 (D) 5

5. 下面程式的執行結果為何？

```
int arr[10] = {5, 10, 15, 20, 25, 30, 35, 40, 45, 50};
int i, sum=20;
for(i = 0; i < 10; i+=2){
  sum = sum + arr[i]; }
printf("sum=%d\n", sum);
```

(A) 145 (B) 125 (C) 170 (D) 130

II. 問答題 (85%)

6. (20%) Consider the following page reference sting:
7, 2, 3, 1, 2, 5, 3, 4, 1, 2, 3

注意:背面有試題

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Assuming demand paging with four frames, please show the process and answer how many page faults would occur for the following replacement algorithms?
(All frames initially contain three pages number 1, 3, 2 (in order))

(a) FIFO replacement
(b) Optimal replacement
(c) LRU replacement
(d) Counting replacement with least frequently used

	7	2	3	1	2	5	3	4	1	2	3
1											
3											
2											

7. (5%) Consider a byte oriented logical address space of 8 pages of 1024 bytes each, mapped onto a physical memory of 32 frames.
(a) How many bits are there in the logical address?
(b) How many bits are there in the physical address?

8. (5%) Consider the two-dimensional array "A[100][100]". If a paged memory system with pages of size 200, for two page frames, how many page faults are generated by the following array-initialization loops, using LRU replacement?

(a)
```
for(int i = 0 ; i < 100; i++)
  {  for(int j = 0 ; j < 100; j++)
     {  A[i][j] = 0;}}
```

(b)
```
for(int j = 0 ; j < 100; j++)
  {  for(int i = 0 ; i < 100; i++)
     {  A[i][j] = 0;} }
```

9. (10%) For sorting n objects, what are the best and worst running time (i.e., $\Omega(.)$ and $O(.)$) of sorting algorithms as below?
(a) bubble sort
(b) quick sort
(c) insertion sort

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(d) heap sort
(e) merge sort

10. (10%) 請寫出下列四種 -1 的二進位元表示法 (以4個位元表示即可)
(a) signed-magnitude (b) one's complement (c) two's complement (d) Excess-3

11. (5%) 要儲存最多六個數字的十進位整數至少需要幾個二進位數字?

12. (5%) Given a program as follow:

```
Int main(void){
    int array[4]={0};
    int *p, i;
    p=array;
    array[0]=1;
    p[0]=2;
    *(p+1)=3;
    p++;
    *(p+2)=4;
    *(p+3)=5;
    p=array;
    for(i=0;i<4;i++)
      { Printf("array[%d]:%d,*(p+%d):%d\n",i,array[i],i,*(p+i));}}
```

What will show on the screen?

13. (15%) Suppose the following characters I, C, D, M, P, S, A, B, G, U, W, N, K, V are inserted into an empty binary search tree 1-by-1. Let the result tree be called as *T*.
(a) Please show tree *T*.
(b) Suppose we delete the root from tree T, and let the result tree be called *T'*. Please show tree *T'*.
(c) Please show the post-order traversal sequence of *T'*.

14. (10%) In a paging system, suppose that the hit ratio is 90% and it takes 10 ns to search the TLB and 100 ns to access memory.
(a) What is the effective memory access time with single-level page table?
(b) What is the effective memory access time with two-level page table?