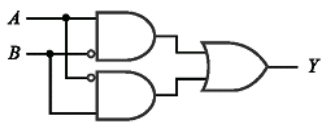
國立中央大學 資訊工程學系

108 學年度 碩士在職專班 招生入學考試命題紙

科目：計算機概論(含資料結構)　　共 5 頁，第 1 頁

Part 1：單選題 (共 10 題，每題 5 分)

1. Convert the decimal number 0.875 to binary.
   A. $(0.101)_2$
   B. $(0.110)_2$
   C. $(0.011)_2$
   D. $(0.111)_2$
2. What is the 8-bit 2's complement representation of -56?
   A. 11001000
   B. 00101011
   C. 11100110
   D. 01010111
3. Which one of the following statements is incorrect?
   A. RAM is a volatile memory.
   B. RAM is readable and writable.
   C. ROM is used to store permanent programs or data, such as BIOS.
   D. The data stored in ROM can disappear with when power off.
4. _____is a situation where a process cannot execute because it is unable access the required resource to process its work.
   A. Deadlock
   B. Starvation
   C. Paging
   D. Synchronization
5. What is the output *Y* in the following logic circuit?



   A. $A \oplus B$
   B. A+B
   C. $\overline{A}B$
   D. $A\overline{B}$

6. Which one of the following is with the highest time complexity?
   A. $O(n^2)$
   B. O(log n)
   C. O(n log n)
   D. O(n)
7. Which one of the following statement is incorrect?
   A. The control unit can generate control signals and control related components in the computer to perform actions.
   B. The CPU can directly operate on the data in the main memory without through registers.
   C. The ALU is a unit that performs arithmetic operations and logical judgments on a computer.
   D. The register is mainly used to temporarily store the data to be calculated or the data that has been calculated and the data which control program executed.
8. What is the situation of “One process waits for a resource, but the resource will never be obtained.”?
   A. Paging
   B. Synchronization
   C. Deadlock
   D. Starvation
9. The machine cycle is mainly divided into three parts. Which one of the following does not belong to the machine cycle?
   A. Fetch
   B. Decode
   C. Execute
   D. Encode
10. A control unit with 4 wires can define up to _____ operations.
   A. 4
   B. 8
   C. 16
   D. 32

Part 2：單選題 (共 10 題，每題 5 分)

1. Which method can be used for synchronizing a operation of the CPU and an I/O device, where the CPU is idle until the I/O operation is finished?
   A. Programmed I/O
   B. Interrupt-driven I/O
   C. DMA
   D. Isolated I/O
2. _____ takes the instructions that want to execute immediately.
   A. Program Counter
   B. Instruction register
   C. ALU
   D. Control Unit
3. Given a list：1, 2, 3, 5, 7, 9. Find the value 5 by binary searching. The first middle value is 3. Which one is the second middle value?
   A. 1
   B. 2
   C. 5
   D. 7
4. Paging can separate memory into several partitions with same size. What are those partitions called?
   A. Pages
   B. Frames
   C. Roots
   D. Leaves
5. The exponent part of Excess_127 is 10000110. Transform the value of 10000110 to decimal number?
   A. 1
   B. 3
   C. 5
   D. 7

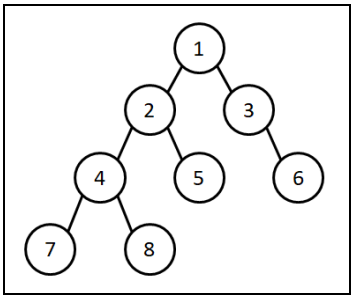
6. Given a list：7, 2, 1, 5, 9, 3. Sort list by using insertion sort. The two steps are shown as below. Which one is the third step?

Step 1	2	7	1	5	9	3
Step 2	1	2	7	5	9	3

   A. 2, 5, 9, 7, 3, 1
   B. 1, 2, 5, 7, 9, 3
   C. 2, 7, 5, 9, 3, 1
   D. 1, 2, 7, 9, 5, 3

7. In the OSI model, which layers contain the TCP and IP respectively?
   A. Physical Layer and Data Link Layer
   B. Physical Layer and Network Layer
   C. Transport Layer and Network Layer
   D. Transport Layer and Session Layer

8. Please make a pre-order traversal, and list the order of visiting nodes.
   A. 74825136
   B. 12478536
   C. 78452631
   D. 12345678



9. Consider the following code in C/C++. If x = 5, what is the value of return?
   A. 15
   B. 50
   C. 120
   D. 125

```
int fun1(int x){
    if(x == 0){
        return 1;
    }else{
        return x*func(x-1);
    }
}
```

10. Consider the following code in Java, and identify the value of n where the program returns true.
    A. 4
    B. 9
    C. 17
    D. 24

```
public static boolean fun2(int n){
    if(n == 1){
    return false;
    }
    boolean result = true;
    for(int d = 2; d<n; d++){
        if(n%d == 0){
            result = false;
            break;
        }
    }
    return result;
}
```