

國立臺北科技大學 102 學年度碩士班招生考試

系所組別：2150 電機工程系碩士班戊組

第一節 計算機概論 試題

第一頁，共二頁

注意事項：

1. 本試題共八大題，其中第一大題有 15 小題，八大題配分共 100 分。
2. 請標明大題、子題編號作答，不必抄題。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。

一、選擇題有 15 小題，每題 2 分，共 30 分

1. Which of the following representations in two's complement notation represents the largest value?
A. 00000010 B. 11111111 C. 00000011 D. 11111110
2. Which of the following is used for storing memory address of instruction to be fetched?
A. Instruction register B. Program counter C. General-purpose register D. ALU
3. Which of the following is an attempt to provide security for operating system?
A. Sniffing software B. Privilege levels C. Multitasking D. Shell
4. What is the result of executing the following CPP program segment?

```
void fun(){ static int y = 5; cout << y++;}  
int main(){ fun(); fun(); return 0;}
```


A. 55 B. 56 C. 66 D. 67
5. Ethernet is a means of implementing which of the following network topologies?
A. Star B. Ring C. WiFi D. Bus
6. Which layer of the TCP/IP hierarchy chops messages into units whose size is compatible with the Internet?
A. Application B. Transport C. Network D. Link
7. Which of the following is **NOT** a means of implementing server-side activities?
A. CGI B. JSP C. ASP D. Applets

8. Given n items, which class does the binary search algorithm belong to?
A. $\Theta(\lg n)$ B. $\Theta(n)$ C. $\Theta(n \lg n)$ D. $\Theta(n^2)$
9. Under the assumption that X takes on only integer values, which of the following is the termination condition for the following loop?

```
while (X < 5) { . . . }
```


A. $X < 5$ B. $X > 4$ C. $X < 4$ D. $X > 5$
10. Which of the following is a means of defining similar yet different classes in an object-oriented program?
A. Inheritance B. Parsing C. Coercion D. Code optimization
11. Which of the following is a means of controlling the complexity of a software system?
A. CRC cards B. Modularity C. Specifications D. Beta testing
12. Which of the following is static in the sense that it does not change size or shape as information is stored and retrieved?
A. Array B. Stack C. Queue D. Tree
13. In a machine language, the technique in which the data to be manipulated by an instruction is included within the instruction itself is called
A. Index addressing B. Direct addressing
C. Indirect addressing D. Immediate addressing
14. How many errors per pattern could be corrected when using an error-correcting code in which any two code patterns differ by a Hamming distance of 8?
A. 3 B. 4 C. 5 D. 6
15. In programming languages, which of the following is the scope of a variable?
A. The number of characters in the variable's name
B. The portion of the program in which the variable can be accessed
C. The type associated with the variable
D. The structure associated with the variable

注意：背面尚有試題

- 二、(a) Derive the truth table of a 2-to-1-line Multiplexer (MUX) if its input pins are I1, I2, sel, and output is Y. (5%)
(b) Draw the detailed logic diagram of this 2-to-1-line MUX using logic gates. (5%)
- 三、(a) What advantage do flash drives have over other mass storage systems which are based on magnetic or optic technology? (5%)
(b) Why flash memory is not suitable for general main memory application? (5%)
- 四、What are the advantage and disadvantage of representing image via vector techniques as opposed to bit map techniques? Explain your answer briefly. (10%)
- 五、Differential encoding, also known as relative encoding, is one of compression techniques to compress consecutive frames of a motion picture. Explain how this technique works. (10%)
- 六、When a computer sends data to a printer, handshaking occurs. Explain why handshaking is necessary and describe the handshaking between these two devices. (10%)
- 七、When a computer is turned on, a procedure of booting is performed. Describe the booting procedure in terms of ROM, RAM, CPU, and operating system. (10%)
- 八、A machine's throughput refers to the total amount of work the machine can accomplish in a given amount of time. Is there any approach that a computer's throughput can be increased without requiring an increase in clock rate? Explain your answer. (10%)