

科目：計算機概論

系所組：電機工程學系(丙組)

有關測驗題(選擇題或是非題)之命題規定：

1. 未按作答格式(範例)作答者，扣該科總分10分。
2. 未在彌封答案卷內作答者，扣該科總分20分。

(範例) 選擇題作答格式：

1. A	2. A	3. B	4. B	5. C
6. A	7. A	8. D	9. C	10. B
11. A	12. A	13. D	14. A	15. D

請依照上述範例之格式，以橫式書寫方式將全部答案寫在彌封答案卷第1頁，答案字母請用正楷大寫(A, B, C, D……)。

1. ( ) If we want to use **printf()** in C programs, which **header file** needs to be included for C preprocessor: (A) string.h, (B) stdio.h, (C) stdlib.h, (D) stddef.h, (E) math.h, (F) it does not need. (5%)
2. ( ) In C language, which of the following statements can correctly **print "Passed"** if the student's grade is greater than or equal to 60, and can **print "Failed"** if the student's grade is less than 60? (The double quotes (" ") are not printed.) (5%)  
 (A) `grade >= 60 ? printf("Failed\n") : printf("Passed\n");`  
 (B) `printf("%s\n", grade >= 60 ? "Passed" : "Failed");`  
 (C) `grade < 60 : printf("Failed\n") ? printf("Passed\n");`  
 (D) `printf("%s\n", grade < 60 ? "Failed" : "Passed");`  
 (E) `grade < 60 ? printf("Passed\n") : printf("Failed\n");`  
 (F) `printf("%s\n", grade >= 60 ? "Failed" : "Passed");`
3. ( ) In which **phase** of C program we can get the **"object code"**? (A) Edit, (B) Preprocess, (C) Compile, (D) Link, (E) Load, (F) Execute. (5%)
4. ( ) In C language, if a function name is **misspelled**, the \_\_\_\_\_ will produce an error because it will not be able to find the function in the library. (A) Compile, (B) Preprocess, (C) Load, (D) Execute, (E) Edit, (F) Link. (5%)
5. ( ) In the \_\_\_\_\_ method for synchronizing the operation of the CPU with an I/O device, a **large block of data** can be passed **from an I/O device to memory directly**. (A) DMA, (B) Interrupt-driven I/O, (C) Program I/O, (D) Isolated I/O, (E) All of the above, (F) None of the above. (5%)
6. ( ) In \_\_\_\_\_ sort, the smallest item is **moved gradually** to the beginning of the unsorted list. It requires **continuously comparing and swapping two adjacent items**. (A) selection, (B) bubble, (C) insertion, (D) sequential, (E) all of the above, (F) none of the above. (5%)
7. ( ) If Mary wants to send an E-mail to Bob, **what protocol do Mary need?** (A) POP3, (B) IMAP, (C) SNMP, (D) ICMP, (E) SMTP, (F) RTP. (5%)
8. Please show the real number  $-161.875$  using **floating-point representation of 32-bit IEEE format**. (10%)

※ 注意：1. 考生須在「彌封答案卷」上作答。

2. 本試題紙空白部份可當稿紙使用。

3. 考生於作答時可否使用計算機、法典、字典或其他資料或工具，以簡章之規定為準。

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9. In C language, what are **the final values (not the printed values)** of the variables 'x' and 'y' when the for loop finishes? (6%)
- ```
int x, y;
for ( x=1, y=5; x<=5, y<=12; x++, y++ )
    printf ("x=%d, y=%d\n", x, y);
```
10. Since computer stores only digitalized data, audio has to be converted into digitalized form to store in computer. There are three steps to convert Audio data into digitalized data, including: sampling, quantization, and encoding. Assume that there are 256 (0~255) levels for each sample and 8000 samples per second. What is the **data rate** of the digitalized audio? (3%)
11. In 4 logic operations of "NOT, OR, AND, XOR": (a) If we want to "reset or clear" specific bits, which logic operation we can use? (b) If we want to "set" specific bits, which logic operation we can use? (6%)
12. About the definition and initialization of a pointer in C language, if the value of a variable "count" is "int" and is 5. There are three steps to define a pointer "countPtr" to point to the variable, refers to the following figure. Please **write down the statements (program)** of these three steps. (9%)

Step 1: count (type is int)

|   |
|---|
| 5 |
|---|

Step 2: countPtr (type is int)

|  |
|--|
|  |
|--|

Step 3:

|          |        |       |
|----------|--------|-------|
| countPtr | -----> | count |
| .....    |        | 5     |

13. Please **use pseudocode to write a recursive algorithm** for finding the greatest common divisor (gcd(x, y)) of two integers x and y. The definition of gcd(x, y) is showed as follows. (5%)

$$\text{gcd}(x, y) = \begin{cases} x & \text{if } y = 0 \\ \text{gcd}(y, x \bmod y) & \text{otherwise} \end{cases}$$

14. Three processes (A, B, and C) are running concurrently and have the same priority. Process A has acquired File 1, but needs File 2. Process B has acquired File 3, but needs File 1. Process C has acquired File 2, but needs File 3. **Is this a deadlock situation?** Please explain your answer. (6%)
15. Please **draw a figure of pipelining** and **briefly describe its purpose**. (10%)
16. Memory mapped I/O is a method to handle the addresses of I/O devices. Please **give an example** and **briefly describe** the method. (10%)

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