

# 國立中正大學

## 112 學年度碩士班招生考試

# 試題

### [第 1 節]

科目名稱	計算機概論
系所組別	資訊管理學系- 甲組 乙組
	資訊管理學系醫療資訊管理

#### —作答注意事項—

※作答前請先核對「試題」、「試卷」與「准考證」之系所組別、科目名稱是否相符。

1. 預備鈴響時即可入場，但至考試開始鈴響前，不得翻閱試題，並不得書寫、畫記、作答。
2. 考試開始鈴響時，即可開始作答；考試結束鈴響畢，應即停止作答。
3. 入場後於考試開始 40 分鐘內不得離場。
4. 全部答題均須在試卷（答案卷）作答區內完成。
5. 試卷作答限用藍色或黑色筆（含鉛筆）書寫。
6. 試題須隨試卷繳還。

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## [ Session I ] Multiple Choice 選擇題(單選，每題 3 分)

Choose ONE answer only for each question (3 points for each question)

1. The memory location of a certain program is DC20<sub>(16)</sub> to E0B9<sub>(16)</sub>, how many bytes is the memory occupied by this program?  
A. 1.28K                      B. 7.81K                      C. 0.488K                      D. 1.15K
2. Which of the following value is BCD<sub>(16)</sub>'s 15's Complement?  
A. 433                      B. 432                      C. 68B                      D. 6AD
3. What is the average rotation time to locate the specific sector in a disk which rotates at the speed of 5400 revolutions per minute?  
A. 5.6msec                      B. 11.1msec                      C. 8.3msec                      D. 83msec
4. Which of the following item is not an input signal of CPU?  
A. Interrupt Request                      B. Data Bus                      C. Address Bus                      D. DMA Request
5. Which of the following has the shortest fetch speed?  
A. Index Addressing                      B. Relative Addressing  
C. Absolute Addressing                      D. Indirect Addressing
6. What is a logic error?  
A. An error that occurs when a program is running because, for example, the wrong operator was used.  
B. An error in a statement that does not conform to the syntax of the programming language.  
C. An error in the hardware from overheating.  
D. An error introduced by the compiler when it guesses at how to fix a syntax error.
7. The ping program use which of the following protocol?  
A. LDAP(lightweight directory access protocol)  
B. SAP(session announcement protocol)  
C. ICMP(internet control message protocol)  
D. SNMP(simple network management protocol)
8. What is the approach that attackers use role playing to represent themselves as people of authority who are requesting information?  
A. trapdoor                      B. social engineering  
C. data diddling                      D. Trojan horse

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[ Session II ] Problems and Calculations 計算與簡答題

1. (5 pts) Express the following function in a simplified product of sums and implement it using only NOR gate:

$$F(W, X, Y, Z) = \sum m(3, 4, 6, 11, 12, 13, 14) + \sum d(9, 15)$$

2. (a) (8 pts) What is SOP and POS respectively?

(b) (8 pts) Use simplified F together with its don't care condition d with SOP and POS respectively.

$$F(A, B, C, D) = \sum(0, 1, 2, 8, 9, 12, 13)$$

$$d(A, B, C, D) = \sum(10, 11, 14, 15)$$

3. (a) (4 pts) A non-pipeline processor A has an average Clock Per Instruction of 4 and has a clock rate of 40MHz. What is the Million Instruction Per Second rate of the processor?

(b) (4 pts) A four-stage pipeline processor B has the same clock rate as processor A, what is the maximum speedup of processor B compared with A?

4. Accounts for the following algorithms, what are the worst time, average time, extra memory need, and stability while using the algorithm to sort  $n$  object?

(a) (16 pts) bubble sort

(b) (16 pts) quick sort

5. For the following I/O interfaces, please explain how do they work, the differences between them, and their efficiency in terms of data transfer rate and processor utilization.

(a) (5 pts) Programmed input/output

(b) (5 pts) Interrupt-device input/output

(c) (5 pts) Direct Memory Access