

國立中山大學 108 學年度 碩士暨碩士專班招生考試試題

科目名稱：計算機概論【資管系碩士班甲組、乙組】

— 作答注意事項 —

考試時間：100 分鐘

- 考試開始響前不得翻閱試題，並不得書寫、劃記、作答。請先檢查答案卷（卡）之應考證號碼、桌角號碼、應試科目是否正確，如有不同立即請監試人員處理。
- 答案卷限用藍、黑色筆(含鉛筆)書寫、繪圖或標示，可攜帶橡皮擦、無色透明無文字墊板、尺規、修正液（帶）、手錶(未附計算器者)。每人每節限使用一份答案卷，不得另攜帶紙張，請衡酌作答。
- 答案卡請以 2B 鉛筆劃記，不可使用修正液（帶）塗改，未使用 2B 鉛筆、劃記太輕或污損致光學閱讀機無法辨識答案者，其後果由考生自行負擔。
- 答案卷（卡）應保持清潔完整，不得折疊、破壞或塗改應考證號碼及條碼，亦不得書寫考生姓名、應考證號碼或與答案無關之任何文字或符號。
- 可否使用計算機請依試題資訊內標註為準，如「可以」使用，廠牌、功能不拘，唯不得攜帶具有通訊、記憶或收發等功能或其他有礙試場安寧、考試公平之各類器材、物品（如鬧鈴、行動電話、電子字典等）入場。
- 試題及答案卷（卡）請務必繳回，未繳回者該科成績以零分計算。
- 試題採雙面列印，考生應注意試題頁數確實作答。
- 違規者依本校招生考試試場規則及違規處理辦法處理。

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共 7 頁第 1 頁

單選題(每題 2.5 分)

- Which one is the biggest, when n approaches to ∞ ?
 - $n \log n$
 - $n^{\log n} / \log \log n$
 - $n^{\sqrt{\log n}}$
 - n^{100}
- Which of the following statements about malware is FALSE?
 - A computer might be infected without connecting to a network
 - Malware might not be an executable file
 - If a machine in a LAN has been infected, the machines in the same LAN might be infected.
 - Browsing URLs will not get infected by malware
- A CPU performs instruction execution by fetch-decode-execute-store cycle. Which component executes the instruction?
 - CU
 - ALU
 - IR
 - MAR
- Which of the following statements about cryptography is FALSE?
 - Symmetric encryption system requires one secret key to perform encryption and decryption
 - Asymmetric encryption system requires one key pair to perform encryption and decryption
 - With the knowledge of a public key, it is hard to know the associated private key
 - Symmetric encryption system can provide digital signature functionality
- Which of the following statements is FALSE?
 - ARP is used for finding the MAC address of an IP address, so ARP is a protocol over IP
 - DNS queries are transmitted through UDP
 - FTP responses are transmitted through TCP
 - HTTP requests and responses are transmitted through TCP
- Which of the following layers does not belong to TCP/IP protocol stack?
 - Data link layer
 - Network layer
 - Transport layer
 - Presentation layer
- Which of the following statements about network mask is FALSE?
 - The first bit of a network mask must be 1
 - The lowest bit of a network mask must be 0
 - The length of a network mask may be vary depending on the number of subnets
 - The default network subnet mask of a class C network address is 255.255.255.0

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共 7 頁第 2 頁

8. Assume that there is a three-frame physical memory in the system. Given the reference string *abcgabadbcbacd*, how many page faults are generated if LRU is used? (Initially, all frames are empty.)
- A. 9
 - B. 10
 - C. 11
 - D. 12
9. Which of the following statements about deadlock is FALSE?
- A. Deadlock will not happen if all the resources can be preemptive.
 - B. Resource allocation graph is used to represent the system state.
 - C. A circle in a resource allocation graph indicates deadlock.
 - D. Deadlock will slow down the system performance.
10. Which of the following statements about TCP is TRUE?
- A. Congestion control ensures that sender won't overflow receiver's buffer by transmitting too much or too fast.
 - B. The receiver side of a TCP connection maintains a buffer storing the data received; the sender side has a buffer, too.
 - C. Round-trip time (RTT) is computed based on the size of sliding window.
 - D. Long retransmission timeout (RTO) indicates high transmission rate
11. A binary operation on non-empty binary strings is defined as follows. To obtain $s \square s'$, take s and replace its last symbol with the last symbol of s' . For example, we have $01001 \square 110 = 01000$. Which of the following statements is true?
- A. This operation is associative
 - B. This operation is commutative
 - C. $010010 \square 1111110 = 0100010$
 - D. None of the above
12. Which of the following statements about cloud computing is FALSE?
- A. Cloud computing is a type of distributed network environments
 - B. SaaS (Software as a Service) is a type of business models in cloud computing
 - C. Google's Gmail is an example of SaaS
 - D. IaaS is the most inefficient business model
13. Which of the following statements about TLS/SSL is FALSE?
- A. TLS/SSL is a security protocol that provides end-to-end communication security over TCP.
 - B. TLS/SSL applies asymmetric cryptography to ensure user authentication
 - C. TLS/SSL applies asymmetric cryptography to encrypt transmitted data
 - D. HTTPS is a security protocol over TLS/SSL

背面有題

試題請隨卷繳回

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共 7 頁第 3 頁

14. Which of the following statements about bootstrap is FALSE?
- A. A bootstrap is the program which resides in ROM
 - B. A bootstrap is to initialize the operating system during startup
 - C. A mobile phone does not require a bootstrap during its startup
 - D. A bootstrap is a loader which loads the kernel into RAM
15. Which of the following statements about computer hardware is FALSE?
- A. All I/O devices use a common device controller to communicate with the operating system
 - B. I/O devices are peripherals of a computer system
 - C. Port is a pathway for an external devices to go into or out of the computer
 - D. RAM is not a peripheral device for a computer
16. Which of the following statements about the binary numeral system is FALSE?
- A. Two's complement of 36 is 1011011
 - B. It requires $N+2$ bits to represent -2^N in one's complement
 - C. An N -bit two's complement numeral system can represent integers in the range of -2^{N-1} to $2^{N-1}-1$.
 - D. Two's complement is adding one to one's complement
17. Which of the following statements is FALSE?
- A. Multiprogramming indicates that there are multiple processes residing in memory
 - B. Multiprocessing system refers that there are multiple CPUs within a computer system.
 - C. A computer system with a single CPU cannot achieve multiprogramming ability
 - D. Multiprogramming can improve CPU utilization
18. Let $G(V, E)$ be a directed graph, where V is the set of nodes; E is the set of edges and is represented in a matrix. What is the time complexity of finding the shortest path for all the pairs of two nodes?
- A. $O(|V|^2)$
 - B. $O(|V|^3)$
 - C. $O(|E|^3)$
 - D. $O(|V|)$
19. What is the math representation of the prefix - A + * / B C D E ?
- A. $A-B/C*D+E$
 - B. $A-B*C/D+E$
 - C. $A+E-B*C/D$
 - D. $A-E+B*C/D$
20. Given a piece of code below. What is the value of the variable w ?
- ```
w = 0;
for (i = 0; i <= 5; i++)
 for (j = 0; j <= i; j++)
 w = w + 2;
```
- A. 30
  - B. 32
  - C. 40
  - D. 42

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題號：442001

共 7 頁第 4 頁

21. Which of the following about Apache Hadoop Distributed File System (HDFS) is FALSE?
  - A. It is often used as an implementation of “data lake”.
  - B. The data/slave node(s) keeps track of the locations of data blocks.
  - C. Data blocks are usually saved in the data/slave nodes.
  - D. Its block size is normally larger than the sizes of typical file systems.
  
22. Which of the following is NOT a common Deep Learning Framework?
  - A. Tensorflow
  - B. MXNet
  - C. OpenCL
  - D. PyTorch
  
23. Which of the following is NOT a common limitation or challenge of Deep Learning?
  - A. A trained model is generally considered a “black-box”
  - B. It usually needs massive computation
  - C. It requires a lot of feature engineering
  - D. It takes time to identify better model structures and parameters
  
24. Which of the following about recent trends in Big Data Analytics is FALSE?
  - A. The adoption of “data lake”
  - B. The rise of heterogeneous computing
  - C. The popularization of in-memory analytics
  - D. The downfall of relational database systems
  
25. Which of the following is NOT a Massively Parallel Processing (MPP) analytical database system.
  - A. Vertica
  - B. Aster
  - C. Greenplum
  - D. MongoDB
  
26. Which of following C statements should appear in a function that adds a node to the end of an existing non-empty linked list. Suppose *newPtr* is a pointer to the new node to be added, and *lastPtr* is a pointer to the current last node. Each node contains a link to a node, *nextPtr*.
  - A. `lastPtr = newPtr;`  
`lastPtr->nextPtr = newPtr;`
  - B. `newPtr->nextPtr = lastPtr;`  
`lastPtr = newPtr;`
  - C. `lastPtr->nextPtr = lastPtr;`  
`newPtr = lastPtr;`
  - D. `lastPtr->nextPtr = newPtr;`  
`lastPtr = newPtr;`

背面有題

試題請隨卷繳回

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共 7 頁第 5 頁

27. Which of the following SQL statements gives all account(s) 2% interest if the balance is higher than 50,000?
- A. UPDATE account a SET a.balance = a.balance \* 1.02 WHERE a.balance > 50000
  - B. UPDATE account a SET a.balance += a.balance \* 1.02 IF a.balance > 50000
  - C. UPDATE balance a SET a.balance = a.balance \* 1.02 WHERE a.balance > 50000
  - D. UPDATE balance a SET a.balance += a.balance \* 1.02 IF a.balance > 50000
28. In C programming language, we can pass a C structure to a function by passing
- A. Structure members
  - B. Entire structure
  - C. A pointer to a structure
  - D. All of the above
29. Let's say we accidentally print elements out of bounds of a C array, which of the following will be the output?
- A. All the elements of the array
  - B. Syntax error
  - C. Nothing
  - D. Some junk values
30. In Python 3, which of the following statements is used in the tasks of multiple-selections?
- A. if ... elif ... else
  - B. switch
  - C. if
  - D. if ... else
31. What is the output of the following C program?
- ```
#include <stdio.h>
int main() {
    int k, n = 20;
    k = (n > 5 ? (n <= 10 ? 10 : 20) : 50);
    printf("%d\n", n);
    return(0);
}
```
- A. 10
 - B. 20
 - C. 50
 - D. 5
32. Which of the following statements is FALSE?
- A. Arrays are dense data structures.
 - B. Data elements in a linked list need not be stored in an adjacent space in memory.
 - C. C Pointer can be used to store the next data element of a linked list.
 - D. Linked list is a collection of nodes that contain information and links to other nodes.

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共 7 頁第 6 頁

33. Which of the following is usually NOT considered a functional programming language?
- A. R
 - B. Scala
 - C. Haskell
 - D. Java
34. Which of the following is usually considered a kind of structured data?
- A. XML files
 - B. Tabular data in relational databases
 - C. Text in emails
 - D. Image files
35. Suppose we have a list of customer names already sorted in alphabetical order and stored in one of the following data structures. The easiest way to print the names in reverse alphabetical order is to use a
- A. Stack
 - B. Binary Search Tree
 - C. Queue
 - D. Linked List
36. Which of the following primitive data types of C/C++/Java should NOT be used to control a counting loop?
- A. double
 - B. int
 - C. long
 - D. short
37. Which of the following bitwise operations is generally used to turn off a particular bit in a number?
- A. AND
 - B. OR
 - C. NOT
 - D. XOR
38. In C/C++, unless explicitly specified, entire arrays are passed _____ and individual array elements are passed _____.
- A. by-value, by-reference
 - B. by-reference, by-reference
 - C. by-value, by-value
 - D. by-reference, by-value

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共 7 頁第 7 頁

39. Consider the following tables, A and B, in a relational database.

A:

<u>ID</u>	V
1	A
3	X
5	C

B:

<u>ID</u>	V
3	X
5	Y
6	Z

How many rows and columns in the output after running the following SQL query?

```
SELECT * FROM  
(SELECT * FROM A UNION ALL SELECT * FROM B) WHERE ID > 3
```

- A. 3 rows and 2 columns
 - B. 3 rows and 3 columns
 - C. 2 rows and 2 columns
 - D. 2 rows and 3 columns
40. C/C++ pointers are variables that contain _____ as their values.
- A. strings
 - B. characters
 - C. memory addresses
 - D. linked lists