

國立中正大學 105 學年度碩士班招生考試試題

系所別：資訊管理學系-甲組、乙組

科目：計算機概論

第 1 節

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(考生作答須知) 總共有40題，每題2.5分，總分100分。

1. Which of the following Boolean operations produces the output 1 for the fewest number of input patterns?
A. AND B. OR C. XOR
2. Which of the following best describes the NOR operation?
A. An XOR followed by a NOT B. An OR followed by a NOT
C. A NOT followed by a NOT D. An AND followed by a NOT
3. Which of the following bit patterns cannot be expressed in hexadecimal notation?
A. 11111111 B. 1001 C. 110011 D. 10000000001
4. Which of the following bit patterns represents the value -5 in two's complement notation?
A. 00011010 B. 11111011 C. 00000101 D. 11111011
5. What is the result of the following subtraction problem (using two's complement notation)?
$$\begin{array}{r} 00001111 \\ - 10101010 \\ \hline \end{array}$$

A. 011000101 B. 10111001 C. 01010101 D. 10110101
6. Which of the following data storage systems provides the most efficient random access to individual data items?
A. Main memory B. Magnetic disk C. CDs/DVDs D. Flash drives
7. Which of the following mass storage system does not require physical motion?
A. Magnetic tape B. Magnetic disk C. DVDs D. Flash drives
8. Which of the following is not contained in a CPU?
A. Instruction register B. Program counter C. General-purpose register D. Memory cell
9. In which of the following locations is information most readily available for manipulation by the CPU?
A. Cache memory B. Main memory C. Mass storage D. General-purpose registers
10. Which of the following instructions does not fall in the category of arithmetic/logic instructions?
A. ROTATE B. ADD C. OR D. JUMP
11. Which of the following is not an activity performed entirely within a CPU?
A. Fetch instructions B. Perform Boolean operations

- C. Perform arithmetic operations D. Move data between registers
12. Which of the following components of an operating system maintains the directory system?
A. Device drivers B. File manager C. Memory manager
13. Multitasking in a computer with only one CPU is accomplished by a technique called
A. Bootstrapping B. Batch processing C. Multiprogramming
14. The end of a time slice is indicated by the occurrence of a signal called
A. An interrupt B. A semaphore C. A login
15. Which of the following events is detrimental to an operating system's performance?
A. Deadlock B. Interrupt C. Booting
16. Which of the following is a technique for controlling access to a critical region?
A. Spooling B. Time sharing C. Semaphore D. B
17. Which of the following is not a role of a typical operating system?
A. Control the allocation of the machine's resources
B. Control access to the machine
C. Maintain records regarding files stored in mass storage
D. Assist the computer user in the task of processing digital photographs
18. Which of the following is not a means of performing multiple activities at the same time?
A. Pipeling B. Multiprogramming C. Virtual memory D. Multiple processors
19. Which of the following connects existing networks to form an internet?
A. Bridge B. Router C. Switch D. Repeater
20. Which of the following is not an application of the Internet?
A. FTP B. Email C. Telnet D. CERT
21. 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
22. Which of the following is an activity?
A. Algorithm B. Program C. Process

23. In general, an algorithm in which of the following categories is considered more efficient?
A. $\Theta(\lg n)$ B. $\Theta(n)$ C. $\Theta(n \lg n)$ D. $\Theta(n^2)$
24. The insertion sort algorithm is an example of an algorithm in which of the following classes?
A. $\Theta(\lg n)$ B. $\Theta(n)$ C. $\Theta(n \lg n)$ D. $\Theta(n^2)$
25. The binary search algorithm is an example of an algorithm in which of the following classes?
A. $\Theta(\lg n)$ B. $\Theta(n)$ C. $\Theta(n \lg n)$ D. $\Theta(n^2)$
26. Which of the following is a loop invariant at the point at which the test for termination is performed in the following loop structure?
- ```
X ← 3;
while (X < 5) do
 (X ← X + 2)
```
- A.  $X > 5$       B.  $X < 5$       C.  $X \geq 5$       D.  $X \leq 5$
27. Under the assumption that X takes on only integer values, which of the following is the termination condition for the following loop?
- ```
repeat ( . . . )  
until (X < 5)
```
- A. $X < 5$ B. $X > 4$ C. $X > 5$
28. Which of the following does not require a Boolean structure?
A. If-then-else statement B. While loop statement
C. Assignment statement D. For loop statement
29. Which of the following is not a step in the process of translating a program?
A. Executing the program B. Parsing the program
C. Lexical analysis D. Code generation
30. Which of the following is not associated with object-oriented programming?
A. Inheritance B. Resolution C. Encapsulation D. Polymorphism
31. Which of the following is ignored by a compiler?
A. Control statements B. Declarations of constants
C. Procedure headers D. Comment statements

32. 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
33. 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
34. The Pareto principle is traditionally applied during which phase of software development?
A. Requirements Analysis B. Design C. Implementation D. Testing
35. Which of the following is a LIFO structure?
A. Array B. Stack C. Queue D. Tree
36. Suppose you were going to retrieve items of data that you would later need to process in the opposite order from that in which they were retrieved. Which of the following would be the best structure in which to store the items?
A. Traditional linked list B. Stack C. Queue D. Tree
37. Suppose a binary tree contained the nodes W, X, Y, and Z, and each node had at most one child. How many terminal nodes would be in the tree?
A. One B. Two C. Three D. Undetermined
38. If the two-dimensional array X were stored in row-major order, then in the block of main memory containing X, which of the following would be true?
A. The entry X[1,2] would appear before X[2,1].
B. The entry X[1,2] would appear after X[2,1].
C. The entry X[1,2] would be in the same location as X[2,1].
D. None of the above
39. Which of the following is not a means of locating an entry in a linked storage structure?
A. Head pointer B. Child pointer C. Root pointer D. NIL pointer
40. If the longest path in a binary tree contained exactly four nodes, what is the maximum number of nodes that could be in the entire tree?
A. 4 B. 7 C. 15 D. 31