(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 bit patterns cannot be expressed in hexadecimal notation?

A. 11111111　　B. 1001　　　　C. 110011　　　D. 100000000001

2. What is the result of the following subtraction problem (using two's complement notation)?

　　　　00001111
　　－ 10101010

A. 011000101　　B. 10111001　　C. 01010101　　D. 10110101

3. Which of the following representations in two's complement notation represents the smallest value?

A. 00000010　　B. 11110000　　C. 00000001　　D. 11111111

4. 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

5. Assuming that each of the following bit patterns originally had even parity, which one contains an error?

A. 100110100　　　　B. 110000011　　　C. 010011000　　　　D. 100011001

6. Which of the following is a means of encoding music?

A. ASCII　B. MIDI　C. JPEG　D. GIF

7. Which of the following is not contained in a CPU?

A. Instruction register　　　B. Program counter　　　C. General-purpose register　　D. Memory cell

8. 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

9. Which of the following instructions does not fall in the category of arithmetic/logic instructions?

A. ROTATE　　B. ADD　　　C. OR　　　　D. JUMP

10. 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

11. Which of the following components of an operating system is not part of the kernel?

A. User Interface　　　B. File manager　　　C. Scheduler

12. Multitasking in a computer with only one CPU is accomplished by a technique called

A. Bootstrapping　　　B. Batch processing　　　C. Multiprogramming

13. The end of a time slice is indicted by the occurrence of a signal called

A. An interrupt　　　B. A semaphore　　　C. A login

14. Which of the following items of information would not be contained in an operating system's process table?

A. The location of the memory area assigned to the process

B. The priority of each process

C. Whether the process is ready or waiting

D. The machine language instructions being executed by the process

15. Which of the following is a technique for controlling access to a critical region?

A. Spooling　　　B. Time sharing　　　C. Semaphore　　　D. Booting

16. Which of the following is not involved in a context switch?

A. Interrupt　　　B. Process table　　　C. Dispatcher　　　D. User Interface

17. Ethernet is a means of implementing which of the following network topologies?

A. Star　　　B. WiFi　　　C. Bus

18. Which of the following connects existing networks to form an internet?

A. Bridge　　　B. Router　　　C. Switch　　　D. Repeater

19. Which layer of the TCP/IP hierarchy decides which application should receive an incoming message?

A. Application　　　B. Transport　　　C. Network　　　D. Link

20. Which layer of the TCP/IP hierarchy reassembles messages as their pieces arrive at the destination?

A. Application　　　B. Transport　　　C. Network　　　D. Link

21. Which of the following identifies the application to which a message arriving from the Internet should be given?

A. Protocol　　　B. Port number　　　C. Domain　　　D. Hop count

22. Which of the following is not an email related protocol?

A. HTTP　　　　B. POP3　　　　C. IMAP　D. SMTP

23. When searching within the list

Lewis, Maurice, Nathan, Oliver, Pat, Quincy, Roger, Stan, Tom

which of the following entries will be found most quickly using the binary search algorithm?

A. Lewis　　　　B. Pat　　　　C. Tom

24. The insertion sort algorithm is an example of an algorithm in which of the following classes?

A. $\Theta(\log_2 n)$　　　B. $\Theta(n)$　　　C. $\Theta(n \log_2 n)$　　D. $\Theta(n^2)$

25. The binary search algorithm is an example of an algorithm in which of the following classes?

A. $\Theta(\log_2 n)$　　　B. $\Theta(n)$　　　C. $\Theta(n \log_2 n)$　　D. $\Theta(n^2)$

26. Which of the following is an example of a language that is based on the object-oriented paradigm?

A. LISP　　　　B. PROLOG　　　C. C　　　D. C++

27. Which of the following does not require a Boolean condition?

A. If- else statement　　　　B. While statement

C. Assignment statement　　　　D. For loop statement

28. Which of the following is not a control statement?

A. If- else statement　　　　B. While statement

C. Assignment statement　　　　D. For statement

29. Which of the following is not associated with object-oriented programming?

A. Inheritance　　B. Resolution　　C. Encapsulation　　　D. Polymorphism

30. 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

31. Which of the following is a notational system for representing object-oriented designs?

A. UML　　　　B. Structure charts　　　C. Modular designs　　　D. Dataflow diagrams

32. Which of the following is a LIFO structure?

A. Array　　　　B. Stack　　　C. Queue　D. Tree

33. 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

34. 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. Tree　　　　B. Stack　　　　C. Queue　　　　D. Traditional linked list

35. Suppose a binary tree contained the nodes W, X, Y, and Z. If W and X were children of Y, and Z had no children, which node would be the root?

A. W　　　B. X　　　C. Y　　　D. Z

36. 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

37. The table below represents a portion of a computer's main memory containing a binary tree stored row by row in a contiguous block as described in the chapter. What is the parent of the node Z?

Address	Contents
50	T
51	U
52	V
53	W
54	X
55	Y
56	Z

A. T　　　B. U　　　C. V　　　D. Y

38. In a machine language, the technique in which an instruction contains the location of a pointer to the data to be manipulated is called

A. Immediate addressing　　　　B. Direct addressing　　　　C. Indirect addressing

39. Which of the following relational operations extracts entire rows from a relation?

A. SELECT　　　B. PROJECT　　　C. JOIN

40. Given the relation below

X:	A	B	C
	2	5	7
	3	3	6
	4	4	2
	5	2	2

what values will be retrieved by the following SQL statement?

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SELECT A, B FROM X WHERE X.B = X.C
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A. 2, 5   B. 3, 6   C. 2, 2   D. 5, 2