

系所組別： 工程科學系乙、戊組

考試科目： 計算機概論

考試日期：0225，節次：2

請勿在本試題紙上作答，否則不予計分

不可使用計算機

一、Multiple choices (60%)

注意：每題最適合的答案可能不只有一個，全部答對給四分，部份答對除不給分外，另須加扣一分。不答題時，不給分也不扣分。

1. Which of the following is correct? (a) The decimal value of binary number 11010.001 is 26.125; (b) A byte can represent a decimal number ranged from 0 to 255; (c) A 8-bit can represent a decimal number from -128 to 127; (d) The decimal number -9 in signed 2's complement of 11110111; (e) The 0 has two different representations in signed 1's complement.
2. An application requires a 3-input AND gate. It is found all three of the inputs actually produce a LOW when the inputs are ON. What type of the gate used to this application? (a) AND; (b) NOR; (c) XOR; (d) NAND; (e) None of the above.
3. A gate type that alone can be used to implement all Boolean functions is called a universal gate. Which of the following is a universal gate? (a) NAND gate; (b) NOT, AND, and OR gates; (c) XOR gate; (d) XNOR; (e) NOR gate.
4. Which of the following is correct? (a) One disadvantage of the ripple-carry adder is more stages are required to a full-adder; (b) In a parallel full-adder, the first stage must be a half-adder; (c) The ripple-carry adder is faster than a look-ahead-carry adder for adding two 20-bit numbers; (d) It needs four 4-bit adders to create a 16-bit adder; (e) All of the above are not correct.
5. What is another name used for a multiplexer? (a) Data selector; (b) Attenuator; (c) Distributor; (d) Multiplier; (e) Repeater.
6. How many times of exchange needs for sorting the data sequence 5, 12, 10, 2, 4, 3 in nondecreasing order? (a) 4; (b) 11; (c) 10; (d) 6; (e) None of the above is correct.
7. Which of the following is correct about binary tree? (a) Given an inorder and its corresponding postorder, a unique binary tree can be decided; (b) Given a preorder and its corresponding postorder, a unique binary tree can be decided; (c) Given a preorder and its corresponding inorder, a unique binary tree can be decided; (d) Given an inorder and its corresponding levelorder, a unique binary tree can be decided; (e) All of the above are not correct.
8. For binary tree traversal, which of the following is not correct? (a) Queue is used for breadth first traversal; (b) Queue is used for inorder traversal; (c) Queue is used for postorder traversal; (d) Stack is used for preorder traversal; (e) All of the above are not correct.

(背面仍有題目,請繼續作答)

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9. For an OS, which of the following statement is not correct? (a) Linux is an open source software; (b) Preemptive scheduling is usually used in a real time OS; (c) Loader is not a part of OS; (d) Dispatcher is not a part of OS; (e) All of above are correct.
 10. For computer language, which of the following statement is correct? (a) C++ is a high level language; (b) C is a declarative language; (c) JAVA is a symbolic language; (d) Assembly is a machine language; (e) Only one of the above is correct.
 11. For data structure (DS) characteristic, which of the following statements is not correct? (a) Stack is a FIFO DS; (b) Queue is a LIFO DS; (c) Array is a random access DS; (d) Link list is a dynamic DS; (e) Priority queue is a FILO DS.
 12. The CPU frequency of computer A and B is 1.5GHz and 2.0GHz, respectively. For performance, which of the statement is correct? (a) A is better than B; (b) B is better than A; (c) A and B are the same; (d) It can not decided; (e) Only one of the above is correct.
 13. For subroutine call, which statement is not correct? (a) Stack is used to maintain the execution order between the caller and called; (b) A routine calls itself is call recursive call; (c) Parameters can be passed via call by address; (d) Parameters can be passed via call by value; (e) Two of the above are correct.
 14. For data base system, which statement is correct? (a) SQL command SELECT will change the data in data base; (b) Candidate key can be used as primary key; (c) Data integrity is ensured the correctness and reliability; (d) A good design can reduce the data repetition. (e) None of the above is correct.
 15. Which unit is included in a Von Neuman machine? (a) Control unit; (b) Input/output unit; (c) Memory unit; (d) Communication unit; (e) ALU.
- 二、 Many addressing techniques have been used to specify the operand of an instruction. Show how the address calculation performed for the addressing mode: immediate, direct, indirect, register indirect, and displacement. Give the principal advantage and disadvantage of each of these addressing modes. (10%)
- 三、 Using **C language** to write a HEAP-SORT **program** to sort the input sequence 6, 9, 2, 4, 10, 7, 3, 15, 11 in nondecreasing order and output the sorting result. For verifying your program is correctly workable, show the intermediate results including the heap and the output step by step. (15%)

四、 For the graph shown, give (a) the representation by adjacency matrix and adjacency list, respectively; (b) the result of topological sort. (c) Is the sorting result unique? (15%)

