臺灣綜合大學系統 105 學年度學士班轉學生聯合招生考試試題

科目名稱	計算機概論	類組代碼	C03
		科目碼	C0302

※本項考試依簡章規定各考科均「不可以」使用計算機	本試題共計 2 頁

一、單選題 (75%) 每題五分，答錯倒扣三分

1. According to the von Neumann mode, what is stored in memory?
   (A) Data (B) Programs (C) Data and programs (D) File (E) None of the above

2. What can be used to maintain the state information on a client's computer?
   (A) Database (B) CSS (C) Cookies (D) All of the above (E) None of the above

3. Which description of Ajax is false?
   (A) Ajax applications must use XML for server responses (B) Ajax applications have existed since the 1990 (C) To handle an Ajax response, register for the XMLHttpRequest object readystatechanged event (D) An Ajax application never needs to reload the page (E) None of the above

4. Which description of a planar graph is false?
   (A) A graph that can be embedded in the plane (B) Edges are cross each other (C) A graph that can be drawn on the sphere (D) Planarity testing can be done in time $O(n)$ (E) None of the above

5. Which description of a binary tree is false?
   (A) Each node has at most two children (B) Each node in a full binary tree has either 0 or 2 children (C) A leaf node has no children (D) Every level in a complete binary tree is completely filled (E) None of the above

6. Which of the following operator is a unary operator in the structured query language?
   (A) Intersection (B) Union (C) Join (D) Project (E) None of the above

7. Which coding method replaces a string by a pointer to the stored string?
   (A) Huffman coding (B) Run-length coding (C) Lempel Ziv coding (D) All of the above (E) None of the above

8. Which data compression method can reserve the exact copy of the original signal?
   (A) MP3 (B) JPEG (C) MPEG (D) All of the above (E) None of the above

9. The advanced encryption standard is an example of ?
   (A) Symmetric-key cipher (B) Asymmetric-key cipher (C) Cryptography hashing function (D) Hash-based message authentication code (E) None of the above

10. Given the Haskell function $f(0) = 1$ and $f(n) = f(n-1) - n + f(n-1) + 2$, what is the value of $f(5)$?
    (A) 6 (B) 10 (C) 35 (D) 40 (E) None of the above

11. A list contains the following elements {7 8 26 44 13 23 57 79}. The first two elements have been sorted using the bubble sort algorithm. What is the value of the third and sixth elements in the list after three more passes of the bubble soft?
    (A) {26 23} (B) {13 44} (C) {13 26} (D) {13 23} (E) None of the above

12. Which of the following operations creates an overflow if the numbers and the results are represented in 8-bits two's complement representation?
    (A) 11000010+00111111 (B) 00000010+00111111 (C) 11000010+11111111 (D) 00000010+11111111 (E) None of the above

臺灣綜合大學系統 105 學年度學士班轉學生聯合招生考試試題

科目名稱	計算機概論	類組代碼	C03
		科目碼	C0302

※本項考試依簡章規定各考科均「不可以」使用計算機　　本試題共計　2　頁

13. What is the 16-bits two's complement of -179?
    (a) 0000000010110011 (b) 1111111101001101 (c) 1111111110110011 (d) 0000000001001101 (e) None of the above

14. A hash file uses a modulo division method with 41 as the divisor. What are the addresses for 14232 and 15341?
    (a) 6 and 8 (b) 9 and 10 (c) 1 and 40 (d) 5 and 7 (e) None of the above

15. A multiprogramming operating system uses paging. The available memory is 60MB divided into 15 frames, each of 4 MB. The first program needs 15 MB. The second program needs 11 MB. The third program needs 25 MB. Which of the following description is correct?
    (a) 15 frames are used by the first program (b) 4 frames are used by the second program (c) 7 frames are used by the third program (d) 2 MB memory wasted (e) None of the above

二、問答題 (25%)

16. Write a C++ program that allows an unlimited number of values to be entered and stored in an array dynamically allocated using a pointer. The program should then output the values, five to a line, followed by the average of the values entered. The initial size of the dynamically allocated array should be five elements. The program should create a new dynamically allocated array with five additional elements, when necessary, and copy values from the old dynamically allocated array to the new one. (8%)

17. Write a class to represent a push-down stack of integers. You cannot get an item that is not at the top without first popping the ones above it. Your class should implement push(), and pop() functions. A print() function is also necessary so that you can check the stack contents. Store the list internally as an array. Write a test program to verify the correct operation of your class. (8%)

18. What is the open system interconnection reference model? What are the layers and the functions of the layers of the open system interconnection reference model? (9%)