系所組別：交通管理科學系丙組

考試科目：計算機概論 考試日期：0223，節次：3

※ 考生請注意：本試題不可使用計算機。 請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

I. Choose a best answer：(30%, 2% for each, no deduction on wrong answer)

1. Which one of the following technologies is the most similar to the operation of proxy servers? (A) virtual memory, (B) time-sharing, (C) cache memory, (D) pipeline, (E) multi-processors.

2. Which one of the following protocols support the fast connectionless service. (A) UDP, (B) TCP, (C) SMTP, (D) ARP, (E) FTP.

3. What is the value of expression (3*8/6%3*7)? (A) 5, (B) 6, (C) 7, (D) 8, (E) 9 .

4. Which one is **not** guaranteed by SET (Secure Electronic Transaction) ? (A) data privacy, (B) message delivery immediately, (C) mutual authentication, (D) message completeness, (E) none of the above.

5. Which phase costs most in the software development? (A) Requirement analysis, (B) Object oriented design, (C) System programming, (D) System debug, (E) System maintenance.

6. Which one is **not** the key concept in dynamic programming? (A) recurrence relation, (B) tabular computation, (C) recursive tree, (D) traceback, (E) none of the above.

7. If the complexity of an algorithm is an^2+bn+c (of a problem of input size n), the code optimization in the compilation process can (A) Reduce the constant a, b, and/or c, (B) Reduce the order of the complexity from 2 to 1, (C) Remove the constant c, (D) Add extra complexity to the algorithm, (E) none of the above.

8. Which one about the von-Neumann model is **not** correct? (A) stored program concept, (B) it's a general computer architecture, (C) four major units including: CU, ALU, I/O, and memory, (D) program and data has separate memory space, (E) none of the above.

9. The machine cycle of a CPU can be summarized as "fetch", "decode", and "execute". How does the CPU know where to fetch the next instruction? (A) main memory, (B) cache, (C) register, (D) control unit, (E) program counter.

10. Which data structure in the following is the best for supporting recursive function call? (A) Queue, (B) Stack, (C) Hash table, (D) Tree, (E) Array.

11. What data structure is best suited for converting an infix expression into a postfix expression? (A) Stack, (B) Queue, (C) binary search tree, (D) hash table, (E) Class.

（背面仍有題目，請繼續作答）

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12. Assume there are four processes in CPU and the arrival time and cpu time needed of these processes are listed in the following table. If we use shortest-job-first algorithm to schedule the process, what is the "average turnaround time" for these processes. (A) 11ms, (B) 12ms, (C) 13ms, (D) 14ms, (E) 15ms.

Process	Arrival time	CPU time needed
1	0 ms	7 ms
2	2 ms	10 ms
3	2 ms	5 ms
4	3 ms	7 ms

13. Which feature is **not** required in the Internet electronic commerce (EC)? (A) Integrity, (B) Non-repudiation, (C) Confidentiality and privacy, (D) Correctness, (E) none of the above.

14. Consider the following C program, what is the value of A(20, 18)？ (A) 2, (B) 20, (C) 18, (D) 5, (E) 3.

```
int A(int m, int n){
   if (m%n==0)
       return n ;
   else return A(n, m%n) ;
}
```

15. Which one about the asymmetric key encryption is **not** correct? (A) public key for encryption and private key for decryption, (B) it is secure, (C) it is fast, (D) it is based on public key encryption, (E) R.S.A is an asymmetric key encryption algorithm.

II、Short-answer questions：（70%）

1. Please briefly explain the following terminologies. <20%>

A. Cloud computing ,

B. Hash function,

C. NP-Complete Problem,

D. CMMI,

E. Vehicle Ad Hoc Network (VANET)

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2. What is "call by value"? What is "call by reference" ? Compare these two parameter passing schemes. <10%>

3. Convert each of the following values. <10%>

   (A) Calculate the Two's complement of -128. <3%>

   (B) Convert 0.00875_{10} to IEEE 754 single precision format. <3%>

   (C) What is the max number in IEEE 754 single precision? <4%>

4. Explain the ACID principles in the database system. <10%>

5. List and explain the five layers of internet communication protocol <10%>

6. Suppose every node in a binary tree has the following structure:

```
struct node {
        int data;
    struct node * leftchild;
    struct node * rightchild;
}
```

   The root of the binary tree is pointed to by a pointer T.

   Write a function that performs an in-order traversal. <10 %>