

※ 考生請注意：本試題不可使用計算機

請勿在本試題紙上作答，否則不予計分

I. Choose the best answer : (20%, 2% for each, no deduction on wrong answer)

1. Which data structure is applied in Relational Database ?

(A) Array, (B) Link list, (C) File, (D) Table, (E) Tree.

2. What is the minimum depth of a binary tree with 843 nodes? (A) 7, (B) 8, (C) 9, (D) 10, (E) 11.

3. Which one of the following concepts does not adopted by object oriented programming languages?

(A) encapsulation, (B) inheritance, (C) polymorphism, (D) identification, (E) abstraction.

4. Which sorting algorithm has the best performance when the given data is nearly sorted? (A) Selection sort,

(B) quick sort, (C) insertion sort, (D) bubble sort, (E) heap sort.

5. 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	5 ms
2	2 ms	9 ms
3	2 ms	4 ms
4	3 ms	7 ms

6. 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.

7. Please transform the Infix sequence [(a-b)*c+d/e] into Prefix sequence.

(A) de/+c*ab (B) ab-c*de/ (C) +*-abc/de (D) *ab-c+/de (E) none of the above .

8. Let $A=(1001001.011)_2$, $B=(243.001)_5$, $C=(81.372)_9$, then (A) $B>C>A$ (B) $B>A>C$ (C) $A>C>B$ (D) $C>A>B$ (E) none of the above.

9. TCP/IP is a reliable protocol because: (A) TCP three-way hand shake transmission mechanism, (B) IP protocol will confirm the packet deliver form the starting point to the terminal point, (C) TCP layer will confirm the packet deliver, (D) IP packets can be delivered by multiple paths form the starting point to the terminal point, (E) none of the above.

(背面仍有題目，請繼續作答)

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：0224，節次：3

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10. How much data can be transmitted per minute when using an ADSL network of speed 8M ?

- (A) 15MBytes, (B) 120MBytes, (C) 960MBytes, (D) 8MBytes, (E) 60MBytes.

II、Short-answer questions：(80%)

1. Briefly explain the following terminologies. <20%>

(A) Von Neumann Bottleneck

(B) NP-Complete Problem

(C) UML

(D) Public Key Infrastructure (PKI)

(E) Vehicle Ad Hoc Network (VANET)

2. What are the main functions of an operating system? <10%>

3. What are the five levels in the CMMI (Capability Maturity Model Integration) model, and what does each level do?

<10%>

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

a. Convert 10110.100011_2 to IEEE 754 single precision format. <3%>b. Convert 3852.05_{10} to IEEE 754 single precision format. <3%>

c. What is the max number in IEEE 754 single precision? <4%>

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

6. Please provide a recursive algorithm to solve the following Fibonacci number. <10%>

 $F_0 = 0, F_1 = 1, F_n = F_{n-1} + F_{n-2}$ for $n \geq 2$. (Note. The case when $n < 0$ must be considered)

7. Draw a binary tree T with the following in-order and pre-order traversals sequences. <10 %>

In-Order: EACKFHDBG

Pre-Order: FAEKCDHGB