

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

- Which one of the following concepts does not adopted by object oriented programming languages?
(A) encapsulation, (B) inheritance, (C) polymorphism, (D) identification, (E) abstraction.
- 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.
- Which one of the following instruction is not included in the SQL DML (or DQL)? (A) SELECT, (B) CREATE, (C) INSERT, (D) UPDATE, (E) DELETE.
- 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

- In the five levels of CMMI model, which layer achieves for "Quantitatively Managed"? (A) Level I, (B) Level II, (C) Level III, (D) Level IV, (E) Level V.
- 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.
- Please transform the Infix sequence $[A*B/C+D/E-F*G]$ into Prefix sequence.
(A) $-*+/*ABC/DEFG$ (B) $-+/*ABC/DE*FG$ (C) $*-+/*ABC/DE*FG$ (D) $*+-*/*ABC/DEFG$ (E) none of the above.
- If $(023)_x + (0111)_2 = (01A)_{16}$, then what is x ? (A) 2, (B) 4, (C) 8, (D) 10, (E) 16.

(背面仍有題目,請繼續作答)

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.

10. How much data can be transmitted per minute when using an ADSL network of speed 2M ? (A)

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

II、Essay questions : (80%)

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

- (A) Cloud Computing, (B) NP-Complete Problem, (C) Metcalfe’s Law,
(D) Certificate Authority (CA), (E) Vehicle Ad-Hoc Network (VANET)

2. What are the main functions of an operating system. <15%>

3. What are the three major techniques in “dynamic programming”? What kind of problems can be solved by “dynamic programming”? <15%>

4. Apply the “quick sort” algorithm to sort the following numbers: “23, 12, 58, 85, 72, 98, 13, 37” by ascending order. Write down the sequence of the numbers in each phase. <10%>

5. Explain the differences, advantages and disadvantages of symmetric and asymmetric key encryption systems. <10%>

6. List the sequences of the following binary tree in (a) Preorder, (b) Inorder, and (c) Postorder. <10 %>

