

一、 單選題 (30%) ※ 本大題請於試卷內之「選擇題作答區」依序作答。

1. ( ) An algorithm is \_\_\_\_\_
  - (a) an equation in linear algebra
  - (b) a step-by-step description of procedures solving a problem
  - (c) the selection of shapes for the flowchart diagram
  - (d) a filtering software
2. ( ) Which one in the following is a declarative programming language?
  - (a) C++
  - (b) FORTRAN
  - (c) Pascal
  - (d) Prolog
3. ( ) Which of the following is only a sequential access medium?
  - (a) RAM
  - (b) optical disk
  - (c) tape
  - (d) hard disk
4. ( ) In order, from less expensive to more expensive and from slower to faster, storage media are
  - (a) floppy disk, compact disc, hard disk, tape
  - (b) hard disk, tape, floppy disk, compact disc
  - (c) compact disc, hard disk, tape, floppy disk
  - (d) tape, floppy disk, compact disc, hard disk
5. ( ) The era of machines built around vacuum tubes is referred to as the:
  - (a) first generation of computers
  - (b) second generation of computers
  - (c) third generation of computers
  - (d) fourth generation of computers
6. ( ) Which of the following is used to find a specific target in an unordered list?
  - (a) binary search
  - (b) sequential search
  - (c) recursive search
  - (d) interpolation search
7. ( ) A process in the ready state goes to the running state when \_\_\_\_\_
  - (a) it enters memory
  - (b) it requests I/O
  - (c) it gets access to CPU
  - (d) it finishes running
8. ( ) Which of the following is the fastest sorting algorithm in general?
  - (a) insertion sort
  - (b) heap sort
  - (c) bubble sort
  - (d) selection sort
9. ( ) Which of the following is not a protocol of transport layer?
  - (a) ICMP
  - (b) SCTP
  - (c) TCP
  - (d) UDP
10. ( ) How many layers does the OSI reference model have?
  - (a) 4
  - (b) 5
  - (c) 7
  - (d) 8

二、 問答題 (70%) ※ 本大題請於試卷內之「非選擇題作答區」標明題號依序作答。

1. 請將十進位的-123 整數轉換為以 16 個位元 (16 bits) 存放的二進位整數，請分別以 sign and magnitude、one's complement、two's complement 三種方式存放該整數。(15%)

bit sequence	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
sign and magnitude :																
one's complement :																
two's complement :																

2. 請說明機器週期 (Machine Cycle) 或稱指令週期 (Instruction Cycle)。(15%)
3. 軟體開發生命週期由各個階段構成，其中一個階段為測試 (Testing)，其目的為保證軟體品質。請討論測試的各種方式。(15%)
4. 網際網路最重要的代表性通訊協定為 TCP/IP，其中 IP 對應於 OSI 參考模式 (Open System Interconnection Reference Model) 網路層 (Network Layer) 的通訊協定。請說明 IP 的特性與各項功能。(15%)
5. 資料庫管理系統會提供建立於其上之資料庫系統在交易處理 (Transaction Processing) 的必要功能，交易處理有一個重要特性為“all-or-nothing”，請說明何謂“all-or-nothing”，並舉實例說明。(10%)