國 立 臺 北 科 技 大 學

九十九學年第一學期電機系博士班資格考試

計算機概論(大學部)試題

一、選擇題：50%（共 20 題，每題 2.5 分）

1. Which of the following components of an operating system is **NOT** part of the kernel?
(A) Shell   (B) Device driver   (C) Scheduler   (D) Memory manager   (E) Dispatcher

2. If a computer with 512MB memory needs to run a 1024MB program, which one of the following technique will be required?
(A) Boot Strapping   (B) Scaling   (C) Time-sharing   (D) Paging   (E) Forking

3. Which of the following software is operated in CPU privilege level?
(A) Application   (B) Kernel   (C) Utility   (D) Shell

4. Which of the following components of an operating system is executed as the result of an interrupt signal?
(A) File manager   (B) Device driver   (C) Scheduler   (D) Memory manager (E) Dispatcher

5. The end of a time slice is indicted by the occurrence of a signal called
(A) Semaphore   (B) Interrupt   (C) Login   (D) Deadlock

6. Which of the following broadcast all received messages to connected bus network?
(A) Bridge   (B) Router   (C) Switch   (D) Repeater

7. Which of the following protocol uses Peer-to-Peer model?
(A) Telnet   (B) Secure Shell   (C) Email   (D) HTML   (E) Bittorrent

8. Which of the following storage systems is best suited for storing and retrieving long strings of data that are processed in their sequential order?

(A) Main memory   (B) Magnetic disk   (C) Optical DVDs   (D) Flash drives

9. Assuming that each of the following bit patterns originally had even parity, which one contains an error?

(A) 10110100   (B) 11000011   (C) 00011000   (D) 10001001

10. Which of the following is **NOT** correct IP address?

(A) 10.6.147.39   (B) 192.168.256.3   (C) 140.123.40.56   (D) 7.7.2.2

11. A technique of a controller on the motherboard to access main memory for performance speedup is called

(A) Memory-mapped I/O   (B) Handshacking   (C) Direct Memory Access   (D) Multiplexing

12. If a computer can only connect to its LAN (Local Area Network), which of the following configuration needs to be checked?

(A) IP address   (B) DNS server   (C) Network mask   (D) Secondary DNS server (E) Default gateway

13. Which of the following is used to translate domain name to IP address?

(A) File server   (B) Mail server   (C) Name server   (D) FTP server

14. When searching within the list

    Lewis, Maurice, Nathan, Oliver, Pat, Quincy, Roger, Stan, Tom

which of the following entries will be found most quickly using the binary search algorithm?

(A) Lewis   (B) Pat   (C) Tom   (D) Nathan (E) Roger

15. Which of the following lists would not be obtained at some point when applying the insertion sort algorithm to the list below?

                        Sylvia
                        Nancy
                        Lois
                        Alice

(A) Nancy	(B) Alice	(C) Alice	(D) Lois
Sylvia	Lois	Sylvia	Nancy
Lois	Nancy	Nancy	Sylvia
Alice	Sylvia	Lois	Alice

16. Which of the following is an example of a language that is based on the object-oriented paradigm?

(A) LISP   (B) PROLOG   (C) C   (D) Java

17. Most machine languages are based on the

(A) Imperative paradigm   (B) Declarative paradigm   (C) Functional paradigm   (D) Object-oriented paradigm
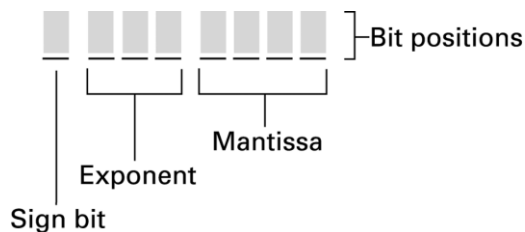
18. Which of the following is a FIFO structure?

(A) Array   (B) Stack   (C) Queue   (D) Tree

19. Suppose a binary tree contained the nodes W, X, Y, and Z. If W and X were children of Y, and Z had no children, which node would be the root?

(A) W   (B) X   (C) Z   (D) Y

20. If a stack contained the entries *w, x, y, z* (from top to bottom), which of the following would be the contents after two entries were removed and the entry *r* was inserted?

(A) *w, x, r*   (B) *r, y, z*   (C) *y, z, r*   (D) *r, w, x*

二、問答題：50%（共 3 題）

1. Build a procedure in C or C++ to merge two sorted integer arrays into one sorted array. (20%)

2. Use C or C++ to write a recursive function to calculate the following equation:

$$f(i) = \begin{cases} (i+1) \cdot f(i-1), & i > 5 \\ i/5, & i \le 5 \end{cases} \quad (15\%)$$

3. In each of the following problems, interpret the bit patterns using the eight bit floating-point format presented as follows, the exponent is presented as 2's complement system. Add or subtract the values represented, and encode the answer in the same floating-point format. Identify these cases if truncation errors occur or not. (15%, 7.5% each)

(a)   01011000   (b) 10111111

-)   00011000   +)   01001000

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