

臺灣綜合大學系統 109 學年度學士班轉學生聯合招生考試試題

科目名稱	計算機概論	類組代碼	A06
		科目碼	A0602

※本項考試依簡章規定所有考科均「不可」使用計算機。

本科試題共計 3 頁

A. Multiple Choice Question (single selection and 4 points each) [本大題請於答案卡作答]

- The data in _____ is erased if the computer is powered down.
 - a tape drive
 - ROM
 - RAM
 - a CD-ROM
 - None of the above
- Which of the following is the decimal number of bit pattern 11100101 in two's complement?
 - 229
 - 26
 - 228
 - 27
 - None of the above.
- Which of the following is an example of a valid ipv6 address?
 - FE80:0000:0000:0202:1010:B30F:FE12:8329
 - 148.78.250.12
 - 00-50-5D-E8-0F-A3
 - ABC:255:255:FFF:000
 - None of the above.
- Which of the following is not a condition necessary for deadlock to exist?
 - Resource holding
 - Reentrancy
 - No preemption
 - Circular waiting
 - Mutual exclusion
- Which of the following is equivalent to 24 in decimal?
 - $(1A)_{16}$
 - $(31)_8$
 - $(11100111)_2$
 - $(17)_{16}$
 - $(00011000)_2$
- For an 8-bit allocation, the smallest decimal number that can be represented in two's complement form is _____.
 - 8
 - 0
 - 127
 - 128
 - 256
- To flip all the bits of a bit pattern, make a mask of all 1s and then _____ the bit pattern and the mask.
 - AND
 - OR
 - XOR
 - NOT
 - XNOR

8. A process in the ready state goes to the running state when _____.
- it enters memory
 - it requests I/O
 - it finishes running
 - it becomes a program
 - it gets access to the CPU
9. _____ is a process in which an algorithm calls itself.
- Insertion
 - Searching
 - Recursion
 - Iteration
 - None of the above
10. If the exponent in Excess_127 is binary 10000101, the exponent in decimal is ___?
- 5
 - 6
 - 7
 - 8
 - 9
11. To prevent ____, an operating system can put resource restrictions on processes.
- starvation
 - synchronization
 - paging
 - deadlock
 - race condition
12. In ____ traversal of a binary tree, the left subtree is processed last.
- preorder
 - inorder
 - postorder
 - level order
 - none of the above
13. What will be the output of the following C program?
- 20, 2, 4
 - 16, 4, 4
 - 20, 4, 2
 - 16, 2, 2
 - none of them
- ```
#include<stdio.h>
int main()
{
 int arr[] = {12, 13, 14, 15, 16};
 printf("%d, %d, %d\n", sizeof(arr), sizeof(*arr), sizeof(arr[0]));
 return 0;
}
```
14. \_\_\_\_ is a lossy compression method for pictures and graphics, whereas \_\_\_\_ is a lossy compression method for video.
- DCT, MPEG
  - MPEG, JPEG
  - JPEG, MPEG
  - JPEG, DCT
  - DCT AVI

15. What is the highest TCP/IP layer responsible for each of the following activities:
- sending a frame to the next node
  - sending a packet from the source to the destination
  - delivery of a long message from the source computer to the destination computer
  - logging in to a remote computer
  - contending the channel access

B. Short Answer Questions [本大題請於答案卷作答]

- Please show the Excess\_127 (single precision) representation of the decimal number -141.875. (8 pts)
- Using the bubble sort algorithm manually sort the following original list in ascending order and show your work in each pass using a table. (10 pts) 請將下列表格彙製於答案卷上做答

| Pass          | List |    |    |    |    |    |
|---------------|------|----|----|----|----|----|
| Original List | 24   | 87 | 46 | 12 | 29 | 56 |
| Pass 1        |      |    |    |    |    |    |
| Pass 2        |      |    |    |    |    |    |
| ⋮             |      |    |    |    |    |    |

- According to the following code segment of C language, please show the print results? (6 pts)

```
#include <stdio.h>
#include <stdlib.h>
int main()
{
 int i , *ptr;
 int array[4][3]={{1,2,3},{4,5,6},{7,8,9},{10,11,12}};
 ptr=(int *)array;
 printf("%d\n",array[3][2]);
 printf("%d\n %d\n",*((array+1))[1],*((array+1)[1]));
 system("pause");
 return 0;
}
```

- Given a computer system with a 32-bit virtual address, 4KB pages, and 8 bytes per page entry, suppose that the maximum physical memory size is 64GB, and the system is byte-addressable. Let paging be implemented for the system. Please answer the following questions: (9 pts)
  - What is the number of bits for physical addresses? What is the maximum number of frames for the system? What is the maximum number of pages for a process? (3 pts)
  - Suppose that multi-level paging is adopted. How many levels do we have? Let the memory access time and TLB access time be 100ns and 20ns, respectively. Suppose that the TLB hit ratio is 99%. What is the effective memory access time? (3 pts)
  - Suppose that the virtual memory of the computer system adopts demand paging. Suppose that the effective memory access time of the computer system without any page fault be 100ns, and the service time for a page fault be 15ms. If the page fault rate is 0.0000004, what is the effective access time under demand paging? (3 pts)
- The bit pattern  $(11001010000000000111000100001111)_2$  is stored in Excess\_127 format. Show the value in decimal. (7 pts)