

國立高雄大學九十五學年度轉學招生考試試題

科目：計算機概論

系所：資訊工程學系二年級

可

使用計算機

考試時間：90 分鐘

本科原始成績：滿分 100 分

否

1. Terminology ( please explain the following terms )
  - (a) (2%) Universal gates
  - (b) (2%) Virtual memory
  - (c) (2%) File Control Block (FCB)
  - (d) (2%) DHCP
  - (e) (2%) Virtual IP
  
2. Number systems describe “states” using different symbols. Suppose a 7-based numbering system describes 7 different states as follows.  
State 0:  $\triangle$   
State 1:  $\nabla$   
State 2: 5  
State 3:  $\blacklozenge$   
State 4:  $\odot$   
State 5:  $\overline{\text{T}}$   
State 6:  $\oplus$ 
  - (a) (5%) Convert  $(\nabla\odot5\oplus)_7$  into the decimal system (10-based)
  - (b) (5%) Convert  $(1226)_{10}$  into the above 7-based system
  
3. (10%) Suppose that a list  $L$  of 8 integers 12, 5, 13, 7, 9, 14, 4, 8 are given. Please design a computing method (or algorithm) that determines if an integer  $k$  exists in  $L$ . Return the *position* of  $k$  if it is found in  $L$  and -1 otherwise. State your algorithm in pseudocode or C/C++/Java.
  
4. (10%) Let  $A_{m \times n}$  and  $B_{n \times m}$  be two matrixes. Please write a pseudocode to compute  $A_{m \times n} \times B_{n \times m}$
  
5. The execution of program codes
  - (a) (5%) What is an instruction cycle?
  - (b) (5%) Describe how a machine instruction is executed in a Von Neumann computer (*hints*: use CPU, MAR, MDR, PC, memory)
  
6. Suppose that in a C program, pieces of statements are given as follows.  
...  
int x=5;  
int \*xPtr;  
...  
x=x+5;  
xPtr=&x;  
...

## 國立高雄大學九十五學年度轉學招生考試試題

科目：計算機概論

系所：資訊工程學系二年級

可

使用計算機

考試時間：90 分鐘

本科原始成績：滿分 100 分

否

After compiling the program, the variable  $x$  is allocated at 001234 and the variable  $xPtr$  is at 002468, as illustrated below.

Main Memory	
Address	Content
000005	35
...	
000010	27
...	
001234	
...	
002468	
...	

After executing the program, what are the outputs of

- (a) (2%)  $\&x$
- (b) (2%)  $\&xPtr$
- (c) (2%)  $*xPtr$
- (d) (2%)  $\&*xPtr$
- (e) (2%)  $*x$

7. (10%) What is call-by-value? What is call-by-reference? What are the differences between them?

8. (10%) What is the content of the variable “*number*” after executing the following C program?

```
#include <stdio.h>
int cubeByReference( int *nPtr );
int main()
{
    int result, number = 5;
    printf( "The original value of number is %d", number );
    result=cubeByReference( &number );
    printf( "\nThe new value of number is %d\n", number );
    return 0;
}
int cubeByReference( int *nPtr )
{
    return *nPtr * *nPtr * *nPtr;
}
```

9. (10%) The IP protocol identifies and classifies the machines connected to the Internet. Please state how “class C” IP’s are defined?

10. (10%) What is netmask? How does netmask operate in an IP-based network?