

AT05
國立臺北科技大學 108 學年度碩士班招生考試

系所組別：1504 自動化科技研究所

第二節 程式設計 試題 (選考)

第一頁 共二頁

注意事項：

1. 本試題共七題，總分 100 分。
2. 不必抄題，作答時請將試題題號及答案依照順序寫在答案卷上。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。

NOTE: For each question, you NEED to state the reasons how and why you reach the answer. Simply write down the answer without any explanation will receive ZERO point.

1. Consider the code shown below, what are the outputs of the code? (15%)

```
#include <stdio.h>

int main()
{
    int arr[5];
    // Assume base address of arr is 2000 and
    // the size of integer is 32 bit
    printf("%u %u\n", arr + 1, &arr + 1);

    return 0;
}
```

2. A one dimensional array A has indices 1....75. Each element is a string and takes up three memory words. The array is stored at location 1120 decimal. What is the starting address of A[49]? (10%)

3. What is the output of the program shown below: (15%)

```
# include <stdio.h>

void print(int arr[])
{
    int n = sizeof(arr)/sizeof(arr[0]);
    int i;
    for (i = 0; i < n; i++)
        printf("%d ", arr[i]);
}

int main()
{
    int arr[] = {1, 2, 3, 4, 5, 6, 7, 8};
    print(arr);
    return 0;
}
```

4. Array is a data structure that can be used to hold the data with the same data type. Consider the code shown below, what are the outputs of the code? (15%)

```
#include <stdio.h>
#define SIZE(arr) sizeof(arr) / sizeof(*arr);
void fun(int* arr, int n)
{
    int i;
    *arr += *(arr + n - 1) += 10;
}

void printArr(int* arr, int n)
{
    int i;
    for(i = 0; i < n; ++i)
        printf("%d ", arr[i]);
}

int main()
{
    int arr[] = {10, 20, 30};
    int size = SIZE(arr);
    fun(arr, size);
    printArr(arr, size);
    return 0;
}
```

注意：背面尚有試題

5. A pointer is a variable whose value is the address of another variable, i.e., direct address of the memory location. Like any variable or constant, you must declare a pointer before using it to store any variable address. Consider the code shown below, what is the output produced by the code? (15%)

```
#include <stdio.h>

int main()
{
    int *ptr;
    int x;

    ptr = &x;
    *ptr = 0;
    *ptr += 5;
    (*ptr)++;
    printf(" *ptr = %d\n", *ptr);

    return 0;
}
```

6. Execution of the code shown below will result in Segmentation fault. Why? (15%)

```
# include<stdio.h>
# include<stdlib.h>

void fun(int *a)
{
    a = (int*)malloc(sizeof(int));
}

int main()
{
    int *p;
    fun(p);
    *p = 6;
    printf("%d\n", *p);
    return(0);
}
```

7. A function is a group of statements that together perform a task. Every C program has at least one function, which is main(), and all the most trivial programs can define additional functions. A function declaration tells the compiler about a function's name, return type, and parameters. A function definition provides the actual body of the function. Consider the code shown below, what is the output of the program? (15%)

```
#include<stdio.h>
void mystery(int *ptrA, int *ptrB)
{
    int *temp;
    temp = ptrB;
    ptrB = ptrA;
    ptrA = temp;
}

int main()
{
    int a=2016, b=0, c=4, d=42;
    mystery(&a, &b);
    if (a < c)
        mystery(&c, &a);
    mystery(&a, &d);
    printf("%d\n", a);
}
```