

Roll No. 2065298

Paper Code: TCS201

B. Tech. Second Semester  
Mid Semester Examination 2018  
Programming in C

MM: 50

Time: 1:30 Hours

Note:

- (i) This question paper contains two sections.  
(ii) Both sections are compulsory.

Section - A

(1 X 5 = 5 Marks)

Q1. True-False/Fill in the blanks

- a) \_\_\_\_\_ is a specific kind of error caused by accessing memory that "does not belong to you."  
b) In C, if we pass an array as an argument to a function, \_\_\_\_\_ actually gets passed.  
c) The \_\_\_\_\_ of an array gives the base address of that array.  
d) A subscript must be an integer or an integer expression (True/False)  
e) Arrays always occupy contiguous memory area. (True/False)

Q2. Attempt any five.

(3 X 5 = 15 Marks)

- a) What is array bound check? Is there any mechanism available in C for array bound checking?  
Predict output of following if code is correct:

```
int main()
{
    int i;
    int arr[5];
    for(i=0; i<=8; i++)
    {
        scanf("%d", &arr[i]);
        printf("%d", arr[i]);
    }
    return 0;
}
```

- b) Predict the output of following code with reason.

```
#include<stdio.h>
int main()
{
    int list[5]={1,2,3,4};
    int data[5];
    printf("%d %d %d %d %d", list[0], list[1], list[2], list[3], list[4]);
    printf("%d %d", data[0], data[3]);
    return 0;
}
```

- c) What will be the output of the program (Assume 16 bit compiler)?

```
#include<stdio.h>
int main()
{
    float arr[] = {12.4, 2.3, 4.5, 6.7};
    printf("%d\n", sizeof(arr)/sizeof(arr[0]));
    return 0;
}
```

- d) Difference between auto and static storage class (in terms of scope/lifetime/default value/storage location)



- c) Is it necessary to declare size of array at compile time? Why? Find valid/invalid statement in following codes according standard:
- ```
int arr[] = {1,2,3};
int arr[2] = {1,2,3};
int arr[n]; //where n is a integer variable
```
- d) How to take string as an input using scanf() function with %s format specifier, Explain the working of gets() and puts() function in C.

### Section - B

Each question contains three parts a, b & c. Attempt any two parts of choice from each question.

**Q3.** (5 X 2 = 10 Marks)

- Write a C program to sort elements of an array from a particular index no. in increasing order.
- Write a C program to toggle/invert the case of all characters in given string without library function.
- What are the advantages and limitation of array in C? Explain with suitable example, the difference between compile time initialization and runtime initialization of 1D array and 2D array.

**Q4.** (5 X 2 = 10 Marks)

- Write a C program to reverse a string without using any string handling library function.
- Write a C program to input elements into a 5x5 matrix. Pass this matrix to 2 different function "upper triangle" and "lower triangle" where these functions print upper triangle and lower triangle according to following diagram:



Upper Triangular Matrix



Lower Triangular Matrix

- Explain syntax, use and working of following string handling library functions: strcpy(), strcmp(), strcat() (2.5 marks x 4 = 10 Marks)

**Q5.** (5 X 2 = 10 Marks)

- Given an array `int arr1[5][7]`. Calculate address of element `arr1[4][6]` using Row major order, where BA=900 and address of next element is 902.
  - Given an array `int arr2[6][8]`. Calculate address element `arr2[5][7]` using Column major order, where BA=300 and address of next element is 304.
- Write a C program to input n elements in an array and print the index no. of second largest element.
- Draw a flowchart to print sum of 2 unequal size 1-D arrays.