KSU/CCIS/CS	CSC 215	Final Exam- Spring 13-14 2 Hours
Name: ..... ID:		

EXERCISE 1 Write True/ False **(/20pts)**

The value of a logical expression is either **true** or **false**	
In C, a variable cannot begin with an underscore	
When a function calls itself, it is called a recursive function	
Within a nested loop, break statement results in interruption of the outer-most loop.	
Arithmetic operators "+", "-", "++"and "--"can be applied to pointers.	
All pointers are of the same size.	
In a logical expression, the operands may be of any arithmetic type while the result is always int.	
The value returned by **isalpha('9')** is 0.	
C language treats a variable of type "array of T" as "pointer to T", whose value is the address of the first element of the array	
Linear search requires the input array to be pre-sorted in increasing order.	

EXERCISE 2 Select the correct answer **(/20pts)**

1- What is the purpose of "r" in the following code: File *fp = fopen("source.txt", "r");

a) open "source.txt" for reading.
b) open "source.txt" for reading and writing.
c) Create a new file "source.txt" writing.
d) Open “source.txt" for appending text to it.

2- When a break statement is encountered within a loop body,

a) The execution of the loop body is interrupted, and the program control transfers to the exit point of the loop.
b) All the remaining statements in the loop body are skipped and the loop continuation condition is evaluated next.
c) The program stops.
d) Nothing happens.

3- Which of the following differences between malloc and calloc **is not** true?

a) malloc allocates number of bytes passed as argument
b) calloc allocates the product of number of elements multiplied by the size of each element, which are both passed as arguments.
c) both malloc and calloc return void*
d) both malloc and calloc initialize allocated memory to all 0

4- What is the correct function to convert a lowercase character to uppercase

a) int isupper(int c)
b) int tolower(int c)
c) int islower(int c)
d) int tolower(int c)

5- Which of the following is the correct usage of conditional operators used in C?

a) a>b ? c=30 : c=40;
b) a>b ? c=30;
c) max = a>b ? a>c?a:c:b>c?b:c
d) return (a>b)?(a:b)

6- Select the expression that is equivalent to the following: c = *cp++;

a) c = *(cp++);
b) c = (*cp)++;
c) Neither

7- Given the following declaration: ***int var;*** Which of the following is the correct usage of scanf?

a) scanf("%d", &var)
b) scanf("%d", *var)
c) scanf("%d", var)
d) None

8- Given the following declarations char c[100]; int i. Select the expression that is equivalent to the following: c[i];

a) c+i
b) *(c+i)
c) &(c+i)
d) None of the above

9- The correct function to read a character from a file is

a) fgets
b) fputc
c) fgetc
d) fputc

10- When the function fgetc encounters the end of a file, it returns

a) NULL
b) EOF
c) 1
d) 0

EXERCISE 3 **(/20pts)**

1- Write the output of the following C program.

```
#include <stdio.h>
void main()
   int a = 5 , b=2, c=7;
   printf("a > b: %d\n", a>b);

   printf("a-c==b+c : %d\n", a-c==b+c);

   printf("a+=b!=c: %d\n" , a+=b!=c);
}
```

2- Write the output of the corresponding C program

```
#include <stdio.h>
void printF (int num) {
   if (num > 1)
      printF(num - 1);

   printf("%d\n", num);
}
main(){
 printF(3);
}
```

3- Write the output of the following C program.

```
#include <stdio.h>
void main()
   int i, n=100, sum=0;
   for (i = 1; i <= n; i++) {
        if (i % 5 != 0) { continue; }
        sum ++;
   }
   printf("The value of sum is %d\n", sum);
}
```

4- Write the output of the following C program

```
#include <stdio.h>
void main()
{
   char s[10] = "CSC215";
   char *p1 = &s[1];
   printf("The value of *p1 is %c\n", *p1);
   p1++;
   char *p2 = &s[5];
   printf("The value of p2-p1 is %d\n", p2 - p1);
}
```

5- Given an array with the following elements: 5 2 4 3 6. Show the array at each step of the first pass of the bubble sort:

5 2 4 3 6 Swap

EXERCISE 4 **(/20pts)**

Write the code to create an array called **d** of 10 doubles and dynamically allocate the memory to the elements of the array. (4pts)

Write the code to de-allocate the memory used by the array d from the previous question. (2pts)

Declare a structure called **Account** with the following elements: **name** as character array of size 20, **aType** as a char and **creationDate** as a structure whose elements are day, month and year. (6pts)

Write the function **linearsearch** that searches for the element key in the array a and returns its index. If the key is not found, the function returns -1. (8pts)

```
int linearsearch (int a[], int n, int key)
 {




}
```

EXERCISE 5 **(/20pts)**

Write a C program that implements the following requirements:

1- Create a linked list node as a structure. The data to be stored in the node is of type int.
2- A function called **insertAtBeginnig** that takes a pointer to the head of a linked list and an int value. The function will insert the value to the beginning of the linked list.
3- A function called **delete** that takes a pointer to the head of a linked list and an int key. The function finds the key in the list and removes it from the linkedlist.
4- A function called **printLinkedList** that takes a pointer to the head of a linked list and prints all the elements of the list separated by a **tab.**
5- A **main** function with the following requirements:
    a. Ask the user to enter a number **n**.
    b. Create a linked list and insert the numbers 1 to n in each node.
    c. Print the elements of the list.
    d. Ask the user to enter a number from 1 to n.
    e. Delete that number from the linked list.
    f. Print the elements of the list.