COS 135 Individual Assignment Week 4

Due: Friday 02/22/19 End of the day

This assignment has 2 sections (part #1 and part #2) in **9 pages**. Please submit a .zip file with answers (**use the answering template attached for part #1**) and source code/s for part #2.

Part #1 (60pts) Select or write the most appropriate answer (please use the answering template provided).

1. In the application's stack memory, recursive functions are executed in a?

a) First In First Out Order
b) Random fashion
c) Parallel fashion
d) Last In First Out Order

2. The statement **printf("%c", 100);** will print?

a) prints 100
b) print garbage
c) prints 'd'
d) None of the above

3. In C functions, the default parameter passing mechanism is called as:

a) Call by Value
b) Call by Reference
c) Call by Address
d) Call by Name

4. What will be the output of the following statements ?

```
int a = 4, b = 7, c;
c = a == b;
printf("%i", c);
```

a) 1
b) error
c) 0
d) garbage value

5. What will be the output of the following code when it is executed?

```
#include<stdio.h>

void func()
{
   int x = 0;
   static int y = 0;
   x++; y++;
   printf( "%d -- %d\n", x, y );
}
int main()
{
   func();
   func();
   return 0;
}
```

a)
1 -- 1
1 -- 1

b)
1 -- 1
2 -- 1

c)
1 -- 1
2 – 2

d)
1 -- 1
1 -- 2

6. What is a constant?

a) Constants have fixed values that do not change during the execution of a program
b) Constants have fixed values that change during the execution of a program
c) Constants have unknown values that may change during the execution of a program
d) None of the above

7. Which is the right way to declare a constant in C?

a) int constant var =10;
b) int const var = 10;
c) const var int = 10;
d) both a) & c)

8. What will be the output if you compile and execute the following c code?

```
#include<stdio.h>

int main(){
   int i = 320;
   char *ptr = (char *) &i;
   printf("%d", *ptr);
   return 0;
}
```

a) 1
b) 64
c) 320
d) Error

9. What will be output if you will compile and execute the following c code?

```
#include<stdio.h>

#define x 5+2

int main() {
   int i;
   i = x * x * x;
   printf("%d\n", i);
   return 0;
}
```

a) 343
b) 27
c) 133
d) Compiler error

10. What will be the output if you compile and execute the following C code?

```
#include<stdio.h>

int main() {
   char c = 125;
   c = c + 10;
   printf("%d", c);
   return 0;
}
```

a) 135
b) -121
c) -8
d) Compiler error

11. what will be the output of the following program?

```
#include<stdio.h>

int main() {
   int i = 5,j;
   j= ++i + ++i + ++i;
   printf("%d %d", i, j);
   return 0;
}
```

a) 5 15
b) 7 18
c) 8 21
d) Compilation error

12. What will be the output of the following program?

```
#include<stdio.h>

int main() {
   int i = 5 , j;
   int *p , *q;
   p = &i;
   q = &j;
   j = 5;
   printf("%d %d", *p, *q);
   return 0;
}
```

e) 5 5
f) Address Address
g) 5 Address
h) Compilation error

13. What will be the output of the following program?

```
#include<stdio.h>

int main() {
    int i = 5;
    int *p;
    p = &i;
    printf("%u %u", *&p , &*p);
    return 0;
}
```

(A) 5 Address
(B) Address Address
(C) Address 5
(D) Compilation error

14. What does the following function print for n = 25?

```
void fun(int n)
{
    if (n == 0)
        return;

    printf("%d", n%2);
    fun(n/2);
}
```

a) 11111
b) 11001
c) 10011
d) 00000

15. What will be the output of the following program?

```
#include<stdio.h>

int main() {
    static int var = 5;
    printf("%d", var--);
    if (var)
        main();
    return 0;
}
```

a) 55555
b) 54321
c) 5432
d) Error

Part #2 (40pts): write C programs for following tasks and submit your source code/s

(a) Write a C program to implement a basic calculator:

I. user has to input two numbers (x and y)

II. **write separate functions** for addition (x + y), subtraction (x - y), multiplication (x * y), and division (x / y)

III. Each function has two numbers as parameters and returns the result

IV. output the results from each function (inside the main function)

V. choose appropriate datatypes and show maximum two decimal points.

Example:

User's **input**

Enter the first number (X) = **12**

Enter the second number (Y) = **10**

Output

X + Y = 22

X - Y = 2

X * Y = 120

X / Y = 1.20

(b) Write a C program to read a student's name and three grades. These three grades are passed by reference to a void function named rankStudentGrades. This function arranges the three grades in ascending order (places the smallest value in the first argument, then the second and the largest value in the third). Finally, the program displays the student name, grades in ascending order, and the average. You may define another function to calculate the average. Maximum two decimal points. You may use the swap function as discussed in the lecture.

```
void swap(int *x, int *y) {

    int temp;
    temp = *x;
    *x = *y;
    *y = temp;

    return;
}
```

Example:

User's **input**

Enter student's name = **James Bond**

Enter student's first grade = **92**

Enter student's second grade = **78**

Enter student's third grade = **86**

Output

James Bond 78 86 92 85.33