COS 135 Individual Assignment Week 5

Due: Friday 03/01/19 End of the day (late submissions -10%)

This assignment has 2 sections (part #1 and part #2) in **8 pages**. Please submit a .zip file with answers (**answering template is attached for part #1**) and complete source code/s for part #2.

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

1. Which of the following statements are true?

a) An **if** statement must have an **else** statement.

b) An **if** statement must have an **else if** statement.

c) An **if** statement must have both an **else if** and an **else** statement.

d) An **else** statement must have a matching **if** statement.

2. Which of the following C statement gives you a warning?

a) if (x != 4)

b) if (x = 4)

c) if (x == 4)

d) if (x < 4)

3. Which of the following statements is true?

a) There is usually only one algorithm to solve a problem.
b) There is often more than one way to solve a problem and some ways may be more efficient than others.
c) There is often more than one way to solve a problem but they are all equally efficient.
d) none of the above

4. If you need to write a loop that will execute a fixed number of times, which statement should you use?

a) for
b) if
c) while
d) do…. while()

5. If you need to write a loop where a sentinel value indicates you want to stop executing the loop, which statement should you use?

a) for
b) if
c) while
d) else

6. A while loop written as **while(1)**:

a) will always be an infinite loop no matter what the loop body contains
b) will never be an infinite loop no matter what the loop body contains
c) might be an infinite loop depending on what the loop body contains
d) will never execute the loop body

7. What would be the final value of **total** in the following program?

```
int total = 1;
while ( (total > 0) && (total < 10) )
    for (int i = 0; i < 4; i++)
        total += i;
printf("total = %d\n", total);
```

a) total = 40
b) total = 13
c) total = 100
d) Compilation error

8. What will be the output of following C program?

```c
#define True 5==5

#include<stdio.h>

int main()
{
    if(.001-0.1)
        printf("David Beckham");
    if(True)
        printf("Ronaldinho");
    else
        printf("Cristiano Ronaldo");
}
```

a) David BeckhamRonaldinho
b) Ronaldinho
c) David Beckham
d) David BeckhamCristiano Ronaldo

9. What will be the output of following C program?

```c
#include<stdio.h>
int main()
{
    if(!printf("Bangor\n"))
        if(printf("Orono\n"));
}
```

e) Orono
f) Bangor
g) Bangor
   Orono
h) Compilation error

10. What will be the output of following C program?

```c
#include<stdio.h>
int main()
{
    int x = 30, y = 2, z = 7;

    if(x / y * z)
        printf("Microsoft");
    else
        printf("Apple");
        printf("Google");
}
```

a) AppleGoogle
b) MicrosoftGoogle
c) Google
d) Compilation error

11. What will be the output of following C program?

```c
#include<stdio.h>
int main()
{
    int a = 5, b = 10;

    if(++a || ++b)
        printf("%d  %d", a, b);
    else
        printf("Error! ");
}
```

a) 5 10
b) 6 11
c) 6 10
d) Error!

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

```
#include<stdio.h>
int main()
{
    int movie = 1;

    switch(movie << (2 + movie))
    {
        case 0: printf("A ");
        case 1: printf("B ");
        case 2: printf("C ");
        case 3: printf("D ");
        case 4: printf("E ");
        case 5: printf("F ");
        case 6: printf("G ");
        case 7: printf("H ");
        case 8: printf("I ");
        case 9: printf("J ");
        default:printf("Z ");
    }
}
```

a) AB C D E F G H I J Z

b) J Z

c) B C D E F G H I J

d) I J Z

13. Boolean (truth) value of the following **if** statement is:

```
if ( !(5 <= 7 && 2 != 2 || 6 >= 4 && 3 >= 9) )
```

a) True

b) False

14. What will be the output of following C program?

```c
#include<stdio.h>
int main()
{
    int check = 3;

    switch(check)
    {
        case 1: printf("Greece ");
        case 2: printf("Italy ");
        case 3: printf("France ");
        default: printf("Germany ");
    }
}
```

a) Germany
b) Italy France Germany
c) France Germany
d) France

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

```c
#include<stdio.h>

int myfunction() {
    int static number = 1;
    return number++;
}

int main() {
    for(myfunction(); myfunction() < 10; myfunction())
        printf("%d ",myfunction());
    printf("\n");
    return 0;
}
```

a) 1 1 1
b) 1 2 3
c) 3 6 9
d) 4 7 10

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

(a) Write a C program to continuously check whether an alphabet entered by the user is a vowel or a consonant. Enter -1 to exit the program.
First your program has to verify the character entered by the user is part of the English alphabet (can be lowercase or uppercase). If yes, check it for a vowel or a constant.

Example:
User's **input and program output**

Enter a letter: a
a is a vowel

Enter a letter: N
N is a consonant.

Enter a letter: $
$ is not a letter in the English alphabet

(b) Write a C program to find the sum of all even numbers between **1** and **n**. *User has to input the **n** number and the program has to verify this is a number before calculating the sum.*

Example:
User's **input and program output**

Input a number larger than 1: 100
Sum of even numbers between 1 and 100: 2550

(c) Mary loves to eat candies. She went to a nearby candy store to buy **N** bags of chocolates and **M** bags of toffees. Price of a bag of chocolate is $15.50, and a bag of toffee is $6.90. Candy store currently has a promotion: if ***anyone buys more than 5 bags of chocolates will be given a 10% discount for every 5 bags***, and ***anyone buys more than 2 bags of toffees will be given a 5% discount (only for the total of toffee bags)***. Furthermore, if ***Mary's grand total is more than $100 she will be given an additional 10% discount***.

Write a program to input the number of chocolate and toffee bags then to display an itemized receipt.

Example:

User's input**:**

Enter store name: **Elmer's Candy Store**

Enter number of chocolate bags: **14**

Enter number of toffee bags: **8**

Program output**:**

Welcome to Elmer's

Chocolates	x14	$ 217.00
after discount		$ 201.50
Toffees	x8	$ 55.20
after discount		$ 52.44
Total after discount		$ 253.94
after 10% discount		$ 228.54
You owe		$ 228.54

Thank you!