**Introduction to Computer Programming (COP 3223) Test #1 Solution**

1) (6 pts) Produce a single Python statement that prints out the following (shown below):

```
"TIC"
'TAC'
\TOE\
```

(Hint: Use an escape sequence.)

**print("\"TIC\"\n'TAC'\n\\TOE\\")**
**(Grading: 1 pt print, 1 pt (), 3 pts esc, 1 pt text)**

2) (4 pts) Write a single line of code that prompts the user with, "Please enter a positive integer", and stores her response in the variable n.

**n = int(input("Please enter a positive integer."))**
**(Grading: 1 pt n, 1 pt =, 1 pt int, 1 pt rest)**

3) (10 pts) Evaluate the following expressions in Python:

| | | | |
|---|---|---|---|
| a) 2 + 5*7 | **37** | f) 5 + 9*(3 - 200%4) | **32** |
| b) 27/4 | **6.75** | g) 5.4%1.2 | **0.6** |
| c) 15//4 | **3** | h) (3 + 5)*8//4 | **16** |
| d) -26//4 | **-7** | i) 3 + 3*8//5 | **7** |
| e) 33%-5 | **-2** | j) 3 + 3*8/5 | **7.8** |

**Grading: 1 pt each**

4) (10 pts) What is the output of the following segment of code:

```
a = 1
b = 4
for i in range(5):
    c = a + b
    print(c, end=" ")
    a = b
    b = c
```

**5 9 14 23 37 (Grading: 2 pts each)**

5) (4 pts) What is the output of the following segment of code:

```
a = 3
b = 5
if a == b or a != b:
    print("A", end = " ")
elif a != b:
    print("B", end = " ")
if a > b and 2*b < a:
    print("C", end = " ")
if True:
    print("D")
```

**A D (Grading:1 pt for print A, D each,1 pt for not printing B,C)**

6) (10 pts) What is the output of the following segment of code?

```
str = "ABCDEFGHIJ"
print(str[2:7])
print(str[:8])
print(str[3:])
print(str[-6:-2])
print(str[:-5])
```

**CDEFG**
**ABCDEFGH**
**DEFGHIJ**
**EFGH**
**ABCDE**

**(Grading: 2 pts each, give 1 pt if off by 1 letter)**

7) (10 pts) What is the output of the following segment of code? Note that the output is not unique, since sets can be listed in any order. Any valid answer will be counted as correct.

```
listx = [2,3,5,6,8]
listy = [2,3,4,7]
x = set(listx)
y = set(listy)
print(x & y)
print(x | y)
print(x ^ y)
print(x - y)
print(y - x)
```

```
{2, 3}
{2, 3, 4, 5, 6, 7, 8}
{4, 5, 6, 7, 8}
{8, 5, 6}
{4, 7}
```

**(Grading: 2 pts each, give 1 pt if off by 1 number)**

8) (10 pts) Create an empty dictionary that maps people to the college they attended. Add the information that "Barack" attended "Columbia" and that "Mitt" attended "Brigham Young". Finally, ask the user to enter their name and college and add this to the dictionary.

```
listcol = {}                                    # 1 pt
listcol["Barack"] = "Columbia"                  # 2 pts
listcol["Mitt"] = "Brigham Young"               # 2 pts
name = input("What is your name?\n")            # 1 pt
college = input("What college did you attend?\n") # 1 pt
listcol[name] = college                         # 3 pts
```

9) (15 pts) The Python program below is intended to determine the minimum price to buy a certain number of candy bars. The user will enter the number of candy bars they wish to buy. Individual candy bars can be purchased for 49 cents while a package of 24 candy bars costs $8. For example, if the user wants 13 candy bars, the minimum price is $6.37, buying the individually. But, if the user wants 17 candy bars, the best price they can obtain is $8 by buying the whole package of 24. Complete the program below so it works properly. **In the interest of time and space, please use the hard-coded values of .49, 24 and 8. Note that normally, this isn't a good practice.**

```
def main():

    n = int(input("How many candy bars do you want to buy?"))

    option1 = (n//24)*8 + .49*(n%24)

    option2 = (n//24+1)*8

    if option1 < option2 :
        print("Your minimum cost is", option1)
    else :
        print("Your minimum cost is", option2)

main()
```

**(Grading: 5 pts for each option, 3 pts for if clause, 1 pt for the variable in each print. Note: This can be solved in many different ways.)**

10) (20 pts) Write a program that prints out all ordered triplets of positive integers (a,b,c) with a < b < c such that a+b+c = n, where n is a positive integer 6 or greater, entered by the user. You should print out one ordered triplet per line. Complete the program scaffold below to solve this problem:

```
def main():

    n = int(input("Enter n.\n"))


    for a in range(1,n+1):                    (5 pts)

        for b in range(a+1,n+1):              (5 pts)

            if n-a-b > b:                     (5 pts)
                print(a,",",b,",",(n-a-b))    (5 pts)




main()
```

10) (1 pt) UCF's next football opponent is the Missouri Tigers. What is the home state of this opposing team?

**Missouri**