CISC106 Intro to CS for Engineers First Name_____ Last Name_____

General Instructions

- This exam 75 minute closed book, closed neighbor. Pace yourself.
- Do not sit next to anyone you are friends with including your lab partner.
- Questions 1-25 are 3 points each. Questions 26-28 are worth 25 points total.
- You may bring and use one page of notes during the exam.
- No calculators permitted (or needed).
- There should be no syntax errors on this exam. If you find one, let the proctor know during the exam.
- Note: 3, 3.0, "3", and [3] are different answers. Be precise.
- True is not the same as true; None is not the same as none.

- Anything in ( ) has highest precedence
- Arithmetic operator precedence:
  - highest ** right to left
  - * / // % left to right
  - lowest + - left to right
- Boolean operator precedence:
  - highest not
  - and
  - lowest or
- {<, >, >=, <=, ==, !=} have precedence over {not, and, or}

PLEASE KEEP YOUR ANSWERS COVERED AT ALL TIMES

1. What **value** does the following expression evaluate to? _____

```
2 ** 3 ** 2
```

2. What **value** does the following expression evaluate to? _____

```
"Mark"   <=   "Mary"
```

3. What is the **value** of the following expression assuming a = 5, b = 3, and c = 8? _____

```
not ((a < b) or (c > a))
```

4. What is the atomic **type** of the following expression? _____

```
285 + 6   ==   81 + 9
```

5.
```
def summult (x,y):
    if (x > y):
        result = x * y
    else:
        result = x + y
    return (result)

x = summult (5, 10)
```

What will be the value of x after execution? _____

6.
```
a = 9
b = a
b = b - 3
a = b + 3
print  (a, b)
```

What will be printed? _____

7.
```
m = 11
n = 77
n = m
m = n
print  (n, m)
```

What will be printed? _____

8.
```
sum = 0
for b in [2,4,6,8]:
    sum = sum + b + 1
    print (sum)
```

What will be printed? _____

9. Write a Boolean expression that evaluates whether the variable **age** is in the interval [13, 20)

_____

10.
```
def  f(x):
     result = x * x
     return

def  g(y):
     result = y + 2
     return  (result)

def  h(z):
     result = 6 * 3
     return (6)

b  =  1
a =  f (g (a  +  b) )
print (result)
```

The above code contains **two run-time** errors. Explain exactly **one** of them:

11. Write code that will compute and print the following summation:
(-21) + (-18) + (-15) + (-12) + (-9) + ... + (999)

12. Assume the variable **num** contains a 5 digit positive integer. Write code to print out the thousands digit. (For example, if **num** contains 85479, your code should print 5.)

13. The operator * is used for _____
a. arithmetic multiplication
b. string repetition
c. list repetition
d. a and b
e. a, b and c

14. Fill in the blank with an integer value to make the assertEqual SUCCEED.

```
def  g(x):
     return (x + 5)

assertEqual ( g ( g ( g (3) ) ), _____ )
```

15.
```
def  bigger(x,y):
     if (x > y):
          print (x)
     else:
          print (y)
     return

x =  bigger(11, 12)
print (x)
```

What will be printed? _____

16. Is each of the following compound conditions overall True or False? (Underline your answer.)

Problem	Answer
True and True or False	True False
True or False and True	True False
False and False or True	True False

17. Write code that assigns a random integer in the interval [1, 50] to the variable **number**?

18. The while loop is a _____ type of loop.
    a. pretest
    b. no-test
    c. prequalified
    d. post-iterative
    e. decision

19. A(n) _____ loop has no way of ending and repeats until the program is interrupted externally.
    a. indeterminate
    b. interminable
    c. infinite
    d. timeless
    e. for

20.
```
x = [3, 6, 9, 12, 15, 18]
for  i  in [1,5,3]:
      print ( x[i]  )
```

What will be printed? _____

21
```
for  x  in [2, 6, 8, 5, 5]:
     for y in range(1,5):
          print(x,y)
```

How many times will the print statement be executed? _____

22.
```
x = 85
if  x < 100:
    grade = "A"
elif x < 90:
   grade = "B"
elif x < 80:
   grade = "C"
else:
   grade = "D"
print(grade)
```

What will be printed? _____

23.
```
s = "fur"
for  i  in ["deer", "horse", "dog"]:
   s = i + s
   print (s)
```

What will be printed? _____

24.
```
p = 1
k = 1
while k <= 5:
    p = p * k
    print (p)
    k = k + 2
print ("done")
```

What will be printed? _____

25. Write code that prints “zero” if the integer variable **x** equals 0, prints “mult3” if **x** is a multiple of 3 (e.g., 3,6,9,12, ...); and prints “not mult3” if **x** is neither 0 nor a multiple of 3. (0 as not considered a multiple of 3.)

The function named Simple has one integer parameter. Valid parameter: if the value passed to the parameter is 1, 2, or 3, the function should return the string "one", "two", or "three", respectively. Invalid parameter: if anything else (e.g., 8, "cat", 3.9, True) is passed to the parameter, the function should return None.

26. (4pts) Write two assertEqual tests for this function, one testing a valid argument value and one testing an invalid argument value.

27. (6pts) Write the function Simple.

28. (13 pts) Write a main program that prompts a user to input an integer in the interval [1, 4]. If the user enters 4, the main program should print "goodbye" and terminate. Otherwise the main program should call your function Simple defined in Question 27 passing it the user's entered value. Then your main program should print the string that Simple returns, and then the main program should terminate.

Input testing requirement: Your main program should gracefully handle the case when the user enters an integer that is not in [1, 4]. In this case, your main program should print a meaningful message, and continue asking the user to re-enter the integer until a value in [1,4] is entered. Your main program need not handle the case when the user types in a non-integer.

Meaningful variable names are required. Comments are not required, but may help earn partial credit.