CIS 210 Fall 2017
Midterm 1

What is the result when the following Python code is executed:

1. `>>> type(99.9)`

a) `<class 'int'>` b) `<class 'float'>` c) `<class 'bool'>`
d) `<class 'str'>` e) `<class 'python'>`

2. `>>> type(True)`

a) `<class 'int'>` b) `<class 'float'>` c) `<class 'bool'>`
d) `<class 'str'>` e) `<class 'python'>`

3. `>>> type('false')`

a) `<class 'int'>` b) `<class 'float'>` c) `<class 'bool'>`
d) `<class 'str'>` e) `<class 'python'>`

4. `>>> type(len('hello') == len('goodbye'))`

a) `<class 'int'>` b) `<class 'float'>` c) `<class 'bool'>`
d) `<class 'str'>` e) `<class 'python'>`

5. Given the following:

```
>>> id(99.9)
4298470336
```

`4298470336` refers to a

a) Python type b) Python built-in function c) memory location d) `None` type

6. `>>> a = 1200` is an example of a Python

a) expression b) assignment statement c) conditional d) loop

7. `>>> len('CIS 210')` is an example of a Python

a) expression b) assignment statement c) conditional d) loop

8. Given the following:

```
1 - >>> ftemp = 212
2 - >>> ctemp = (ftemp - 32) * 5/9
3 - >>> ctemp = ftemp - 32 * 5/9
```

The *value* of `ctemp` will **[??]** from line 2 to line 3; The *type* of `ctemp` will **[??]** from line 2 to line 3

a) stay the same/change b) change/stay the same c) stay the same/stay the same
d) change/change

9. Given the following Python code, what will be printed in the Shell:

```
>>> b = 20
>>> a = b + 1
>>> b = 30
>>> a
```

a) `20` b) `21` c) `30` d) `31` e) nothing will be printed

10-11. What will be printed when the following Python code is executed?

```
yellow_ct = 0
for ctr in range(3):
    yellowCt = yellow_ct + 1

print(yellow_ct)
```

10. a) `0` b) `1` c) `2` d) `3` e) nothing will be printed

11. The code in question 10 does not work as intended. This is due to Python's

a) static typing b) dynamic typing c) strong typing d) weak typing

12. What are the values of `a` and `b` after the following Python code executes:

```
a = 10
b = 3
t = 0
for i in range(1, 4):
    t = a
    a = i + b
    b = t - 1
```

a) `10, 3` b) `11, 3` c) `6, 10` d) `10, 11` e) `3, 11`

13. Order the lines of Python code to implement an accumulator pattern (ignore lack of indents):

```
1 - p = p * i
2 - p = 1
3 - for i in range(10):
```

a) 1, 2, 3 b) 2, 3, 1 c) 3, 1, 2 d) 3, 2, 1 e) 2, 1, 3

14. What value is returned when the following Python code is executed:

```
def qx(n):
    '''(integer) -> ??

    Test function.
    '''
    ctr = 0
    while n > 1:
        n = n // 2
        ctr += 1

    return 'The end.'

qx(7)
```

a) `1` b) `2` c) `3` d) `'The end.'` e) `None`

15. What value is returned when the following Python code is executed:

```
def qx(n):
    '''(integer) -> ??

    Test function.
    '''
    ctr = 0
    while n > 1:
        n = n // 2
        ctr += 1

    return ctr

qx(7)
```

a) `1` b) `2` c) `3` d) `'The end.'` e) `None`

16-18. Given the following Python code:

```
def q16(age, salary):
    '''
    (number, number) -> ??

    Test function.

    >>> q16(18, 5000)
    ??
    '''
    return (age < 18) and (salary < 10000)
```

16. Complete the type contract:

a. number b. integer c. float d. Boolean

17. What value is returned when `q16(18, 5000)` is executed?

a. `18` b. `5000` c. `5018` d. `True` e. `False`

18. To determine this value, Python evaluated

a.
```
(age < 18)
(salary < 10000)
```

b.
```
(age < 18)
```

c.
```
(salary < 10000)
```

19-22. Given the following Python code:

```
def mysqrt(n, k):
    '''(integer, ??-19) -> ??-19

    Generates an approximate square root of n,
    a positive number, via an iterative process
    that runs k times.

    The approximate square root is returned.

    >>> mysqrt(25, 5)
    5.0
    '''

    approx_val = 1
    for ctr in range(k):
        approx_val = .5 * (approx_val + n/approx_val)

    return round(approx_val, 2)

mysqrt(25, 5)
```

19. Complete the type contract:

a. bool/float b. float/None c. integer/integer d. integer/float

20. The first time the `for` loop executes, the value of `k` is
a. `0` b. `1` c. `4` d. `5` e. `k` is not defined

21. The first time the `for` loop executes, the value of `ctr` is
a. `0` b. `1` c. `4` d. `5` e. `ctr` is not defined

22. After the for loop has finished executing, the value of `n` is
a. `0` b. `1` c. `4` d. `25` e. `n` is not defined

23-26. Given the following Python code:

```
1 - def twice(x):
2 -   '''(int) -> int

3 -   Return x multiplied by 2.

4 -   >>> twice(3)
5 -   6
6 -   '''
7 -   y = 2
8 -   result = y * x
9 -   return result
```

What will the result be when the following Python code is executed?
`>>> y = 5` then

23. `>>> twice(y)`

a. `0` b. `2` c. `5` d. `10` e. `NameError`

24. `>>> y`

a. `0` b. `2` c. `5` d. `10` e. `NameError`

25. `>>> x`

a. `0` b. `2` c. `5` d. `10` e. `NameError`

26. When the following Python code is executed

```
>>> z = 10
>>> twice(z)
```

what is the value of `x` at line 8 of the `twice` function?

a. `0` b. `2` c. `5` d. `10` e. `error`

27-28. You are given the following Python code:

```
def square():
    '''() -> None

    Use Python turtle graphics to
    draw a square.

    >>> square()
    [draw square on turtle Canvas]
    '''
    for i in range(4):
        fd(100)
        lt(90)

    return None
```

with the assignment to make changes so the function can draw any polygon shape.
Some progress has already been made; finish the work:

```
def poly(s):
    '''(int) -> None

    Use Python turtle graphics to
    draw an s-sided polygon.
    >>> ??-27
    [draw square on turtle Canvas]
    '''
    for i in range(??-28):
        fd(100)
        lt(360 / s)

    return None
```

27. a. `poly` b. `poly()` c. `poly(4)` d. `poly(s)`

28. a. `4` b. `s` c. `ctr` d. `10`

29-30. Given the following Python code:

```
def q29(s):
    '''
    (??) -> ??

    Test function.

    >>> q29('The quick brown fox')
    5
    >>> q29('Hello, world.')
    3
    '''
    vowels = 'aeiou'
    result = 0
    for i in range(len(s)):
        if s[i] in vowels:
            result += 1

    return result
```

29. Complete the type contract:

a) str/str b) int/int c) str/float
d) str/bool e) str/int

30. Executing this function will

a) Return count of vowels in s.

b) Return count of characters in s.

c) Print count of vowels in s.

d) Print count of characters in s.

e) Causes an infinite loop.