CIS 122 Winter 2022 Midterm 2 ** KEY **

This midterm has 32 questions on 8 pages. No outside resources are permitted during the exam, with the exception of one index card of handwritten notes.

(1) The temperature in degrees Celsius (\( t_c \)) is obtained by subtracting 32 from the Fahrenheit temperature (\( t_f \)), then multiplying that number by 5/9. Which Python expression(s) correctly converts a Fahrenheit temperature to the corresponding Celsius temperature?

a) \( t_c = t_f - 32 \times 5 / 9 \) 

b) \( t_c = (t_f - 32) \times 5 / 9 \) 

c) \( t_c = (t_f - 32) \times 5 / 9 \) 

d) \( t_c = (t_f - 32) \times 5 / 9 \) 

e) a) and b)

(2) Given the following Python code:

```python
>>> x = 25 // 5
>>> x
```

What value is returned and printed in the Shell when x is evaluated?

a) \( x \) 

b) \( 5 \) 

c) \( 5.0 \) 

d) \( 125 \) 

e) none of these

(3) Which of the following is a valid Python assignment statement?

a) \( \text{def} = 99 \) 

b) \( 6 = 3 \times 2 \) 

c) \( \text{abs} = \text{True} \) 

d) \( \text{greet} = \text{\}'hi'\text{\}} \) 

e) \( \text{ttl$} = 5.53 \)

(4-6) What will be the result when the following Python code is executed?

(4) >>> type(False)

a) \( \text{str} \) 

b) \( \text{float} \) 

c) \( \text{int} \) 

d) \( \text{bool} \) 

e) NameError

(5) >>> type('False')

a) \( \text{str} \) 

b) \( \text{float} \) 

c) \( \text{int} \) 

d) \( \text{bool} \) 

e) NameError

(6) >>> false = 99 / 9

>>> type(false)

a) \( \text{str} \) 

b) \( \text{float} \) 

c) \( \text{int} \) 

d) \( \text{bool} \) 

e) NameError
(7-9) Given the following Python code:

```python
1  def triangle(side, tcolor):
2      
3          # determine turn angle
4          numsides = 3
5          turn_angle = 360 / numsides
6          
7          fillcolor(tcolor)
8          begin_fill()
9          for i in range(3):
10             fd(side)
11             lt(turn_angle)
12             
13          end_fill()
14          return
```

(7) Local variables in `triangle` include

a) `triangle`  b) `side`, `tcolor`  c) `turn_angle`, `numsides`

d) a) and c)  e) b) and c)

(8) When the following code is executed

```python
>>> triangle(250, 'yellow')
```

triangle is a(n)

a) parameter  b) argument  c) identifier  d) keyword

(9) When the following code is executed

```python
>>> triangle(250, 'yellow')
```

the value of `side` at line 19 the last time the for loop executes is

a) 100  b) 250  c) 300  d) 360  e) NameError
(10-13) Given the following Python code:

```python
def calculate(a, b):
    '''
    mid2 function
    '''
    #a = 5
    #b = 6
    x = a % 2
    y = b ** 2
    z = (x + y) + 3
    #print(z)
    return z

def main():
    '''driver for calculate'''
    number1 = input('enter first number: ')
    number2 = int(input('enter second number: '))
    calculate(number1, number2)

main()
```

(10) What is the result when the following code is executed

```
>>> calculate(3, 4)
```

a) 8 b) 20 c) 40 d) None e) TypeError

(11) When lines 5 and 6 are uncommented, what is the result when the following code is executed

```
>>> calculate(1, 2)
```

a) 8 b) 20 c) 40 d) None e) TypeError

(12) What is the result when the following code is executed

```
>>> main(3, 4)
```

a) 8 b) 20 c) 40 d) None e) TypeError

(13) What is the result when the following code is executed

```
>>> main() (user enters: 5 and user enters: 6)
```

a) TypeError (line 18) b) TypeError (line 19) c) TypeError (line 20)

d) TypeError (line 1) e) TypeError (line 8)
Given the following Python code:

```python
1  def fb(n):
2      '''
3          Midterm 2 function
4      '''
5      for i in range(1, n+1):
6          m3 = (i % 3) == 0
7          m5 = (i % 5) == 0
8          if m3 and m5:
9              print('fizzbuzz')
10             elif m3:
11                print('fizz')
12                elif m5:
13                    print('buzz')
14                else:
15                    print(i)
16      print('Game over!')
17  return
```

When the following code is executed

```python
>>> fb(5)
```

(14) What is the result?

(a)  1  2  3  4  5
     buzz  fizz  buzz  fizz  buzz

(b)  1  2  3  4  5
     1  2  fizz  fizz  buzz

(15) The first time the for-block executes, the value of m3 at line 8 is

a)  1  b) 'fizz'  c) 'buzz'  d) True  e) False

(16) The first time the for-block executes, the value of i at line 8 is

a)  1  b) 'fizz'  c) 'buzz'  d) True  e) False

(17) What is the type of m5?

a) int  b) float  c) str  d) bool  e) none of these
(18) If line 9 were replaced with the following code:

```python
9     if m3 or m5:
```

this would change the result of which calls to execute `fb`?

a) `fb(1)`  
b) `fb(2)`  
c) `fb(3)`  
d) all of these  
e) none of these

(19) If line 5 were replaced with the following code (2 lines) (no other changes):

```python
5a     i = 1  
5b     while i <= n:
```

this would change the result of which call(s) to execute `fb`?

a) `fb(1)`  
b) `fb(3)`  
c) `fb(5)`  
d) `fb(15)`  
e) all of these

(20-21) Given the following Python code:

```python
import random
from turtle import *

def temperature():
    '''
    return random measure of temperature on mars
    >>> temperature()
    0 [for example]
    '''
    return random.randint(-178, 1)

def mars_explore():
    '''
    Midterm function.
    >>> mars_explore()
    ??
    '''
    for trips in range(10):
        t = temperature()
        print(t)
    return

(20) random and turtle are Python

a) built-in functions  
b) user-defined functions  
c) strings  
d) library modules

(21) How many temperature values will be reported when `mars_explore()` is called?

a) 0  
b) 1  
c) 9  
d) 10  
e) 11
(22-25) Given the following UNTESTED Python code:

```python
1 def twice(x):
2     '''
3     Midterm 2 function
4     '''
5     y = 2 * x
6     print(y)
7     return
8
def main():
9     '''driver'''
10     number = int(input('enter an integer: '))
11     result = twice(number)
12     print(result)
13     return
```

When the following code is executed

```python
>>> main() (user enters: 5)
```

(22) What output would be printed?

a) 10  b) 10  c) 5  d) None  e) error

(23) The value of number at line 12 is

a) 5  b) 10  c) '5'  d) None  e) NameError

(24) If line 13 were replaced with print(y), what would be printed?

a) 5  b) 10  c) '5'  d) None  e) NameError

(25) Which change would fix the code so that it works as intended?

a) comment out line 13; change line 14 to return result
b) comment out line 13; change line 14 to return number
c) comment out line 6; change line 7 to return x
d) comment out line 6; change line 7 to return y
e) comment out line 6; change line 7 to return number
(26) Given the following Python code:

def q26(year):
    '''
    Midterm 2 function.
    '''
    if year >= 4:
        response = input('Will you graduate this year? (y or n) '
        return response == 'n'
    else:
        return True

Which best describes what q26 does?

a) returns True if year >= 4 or response is 'n'
b) returns True if year >= 4 and response is 'n'
c) returns False if year >= 4 or response is 'n'
d) returns False if year >= 4 and response is 'n'
e) returns False if year < 4

(27-28) Given the following Python code:

```python
1  def q27(lead, ball, time):
2      '''
3      Midterm 2 function.
4      '''
5      calc_lead = lead - 3
6
7      if ball:
8          calc_lead += .5
9      else:
10         calc_lead -= .5
11
12     calc_lead = calc_lead ** 2
13
14     if (calc_lead > time):
15         return True
16     else:
17         return False
```

When the following code executes

```python
>>> q27(7, True, 20)
```

(27) The value of calc_lead at line 11 is

a) 7  b) 4  c) 4.5  d) 3.5  e) none of these

(28) The value of time at line 11 is

a) 20  b) 20.5  c) 19.5  d) True  e) none of these
(29-32) Given the following Python code:

```python
1  def savings(deposit, percent):
2      '''(deposit: number, percent: number) -> integer
3
4      Starting with deposit, savings grows at an
5      annual percentage (percent) rate of rate.
6      Calculate the amount of savings at the end
7      of each year. Return how many years
8      it will take to double the initial deposit.
9
10      >>> savings(100, 5)
11      15
12      '''
13      csave = deposit
14      yr = 0
15      rate = percent * .01
16      while csave <= (deposit * 2):
17          csave += csave * rate
18          yr += 1
19      return yr
20
>>> initial = 100
>>> double = savings(initial, 10)

(29) The value of csave at line 16 is

a) 5  b) 100  c) 105  d) 200  e) NameError

(30) The value of percent at line 16 is

a) .01  b) 10  c) 100  d) 105  e) NameError

(31) Which line could replace line 17 without changing the function result?

a) for csave in range(6):  b) for i in range(deposit):
    c) while csave <= (deposit * rate):
    d) while csave > (deposit * 2):
    e) none of these

(32) The value of double after savings(initial, 10) has executed is

a) 1  b) 8  c) 100  d) 200  e) NameError