

SAMPLE MIDTERM

20 Multiple Choice Questions

1 Two-part Coding Question

You may not use any books or notes. You may not use a calculator or any other device besides a pen, pencil and eraser.

We do not provide solutions to these questions however if you come to any office hours we are happy to help you work through a problem and will confirm correct responses.

1. What is the value of `y` after the following code is executed?

```
x = 5
y = 2*x
x = 50
```

- a) 5
- b) 10
- c) 50
- d) 100
- e) it is impossible to determine

2. After the execution of the following statements, what is the value stored in the variable `a`?

```
x = 3.6
a = x
x = 2.1
a = int(a)
```

- a) 2
- b) 2.1
- c) 3
- d) 3.6
- e) 4

3. After executing the following statements, what is the value stored in the variable `p`?

```
x = -1
y = -2
z = 13
p = (x>y and y>z) or (x<z)
```

- a) True
- b) False
- c) -1
- d) -2
- e) 13

4. What is the value of `z` after the while loop below terminates?

```
y=2
z=y
while y>0:
    z=z+2
    y=y+1
```

- a) 1
- b) 2
- c) 3
- d) 4
- e) This will cause an infinite loop and therefore will not terminate.

5. What will be assigned to the variable `b` after the execution of the following code?

```
a = 'New York City'
b = a[4:6]
```

- a) 'Yo'
- b) 'Yor'
- c) ' Y'
- d) ' Yo'
- e) 'York'

6. In the function definition below what type is returned?

```
def f(a,b):
    return a*b
```

- a) int
- b) float
- c) str
- d) list
- e) It is impossible to determine.

7. In the function call below what type is `a`?

```
a=1.0
b='happy'
c=f(a,b)
```

- a) int
- b) float
- c) str
- d) list
- e) It is impossible to determine.

8. What is the result of the operation `9//2` in Python?

- a) 1
- b) 4
- c) 4.5
- d) 9
- e) An error will occur

9. What will the following statements print?

```
x=0
l=[1,3,5,9]
for i in l:
    if i%2==0:
        x=x+1
print(x)
```

- a) 0
- b) 1
- c) 2
- d) 4
- e) 9

10. What will the following code segment print?

```
def f(a,b):
    print(a * b)

f(3,'9')
```

- a) `3 * 9`
- b) 27
- c) 39
- d) 999
- e) This will cause an error.

11. What will the following code segment print?

```
def f(a,b):
    print(a + b)

a='13'
b='7'
f(b,a)
```

- a) 20
- b) 137
- c) 713
- d) `13 + 7`
- e) `7 + 13`

12. Which list below will be generated by the following function call?

```
def f(x):  
    return [i for i in range(1,x) if x%i==0]  
  
f(12)
```

- a) [1,2,3,4,5,6,7,8,9,10,11,12]
- b) [1,2,3,4,5,6,7,8,9,10,11]
- c) [1,3,5,7,9,11]
- d) [1,2,3,4,6]
- e) This code will cause an error.

Consider the following function in Python for questions 13-14.

```
def mystery(a):  
    import random  
    return int(random.random()*a+1)
```

13. What is the value of x after the following is executed?

```
x=mystery(3)
```

- a) 0
- b) 1
- c) 2
- d) 3
- e) it is impossible to determine.

14. What is the value of x after the following is executed?

```
x=mystery(0)
```

- a) 0
- b) 1
- c) 2
- d) 3
- e) It is impossible to determine.

15. What does the variable list1 reference after the execution of the following code?

```
list1 = [25, -10, 0]  
list2 = sorted(list1)  
list2[0] = 100
```

- a) [100,0,25]
- b) [-10,0,25]
- c) [25, -10, 0]
- d) [100, -10, 0]
- e) [-10, 0, 100]

16. What does the variable `list1` reference after the execution of the following code?

```
list1 = [25,-10,0]
list2 = list1
list1.sort()
list2[1]=100
```

- a) `[-10,0,25]`
- b) `[25,-10,0]`
- c) `[25, 100, 0]`
- d) `[-10, 0, 100]`
- e) `[-10, 100, 25]`

17. What are the values of `x` and `y` after the following code is executed?

```
def f(x,y):
    x=4
    return 2*y
x=5
y=12
y=f(y,x)
```

- a) `x=4, y=10`
- b) `x=4, y=24`
- c) `x=5, y=10`
- d) `x=5, y=24`
- e) This code will cause an error

18. Suppose `x` is assigned a value as follows:

```
x = {3:{3,4,3},2:['happy','sad','joy','pain'],'happy':12.6}
```

What is the value of `x[2][2]`?

- a) `12.6`
- b) `'happy'`
- c) `'joy'`
- d) `'sad'`
- e) This will cause an error

Consider the following function in Python for questions 19-20.

```
def mystery(a,b):  
    while (a!=b):  
        if (a<=b):  
            b=b-a  
        else:  
            a=a-b  
  
    return a
```

19. What is the value of x if the following is executed?

```
x = mystery(24,10)
```

- a) 1
- b) 2
- c) 10
- d) 14
- e) 24

20. What is the value of x if the following is executed?

```
x = mystery(7,16)
```

- a) 1
- b) 2
- c) 7
- d) 9
- e) 16

Part 2: Coding

a) Write a function f that takes two strings as parameters and returns true if *every* character in the first string also appears in the second string. Your function should ignore case for letters so letters like 'h' and 'H' should be considered equivalent. For example, if

```
s1='Happy'
s2='the hippo ate your lunch'
```

$f(s1,s2)$ should return true but $f(s2,s1)$ should return false.

Your function definition here:

b) Write a function g that takes two strings as parameters and returns true if *at least one* character in the first string also appears in the second string. Your function should ignore case for letters so letters like 'h' and 'H' should be considered equivalent. For example, if

```
s1='Happy'
s2='the hippo ate your lunch'
```

$g(s1, s2)$ should return true and $g(s2, s1)$ should also return true.

Your function definition here: