

1. Assume  $x = [[1, 2], [3, 4, 5], [5, 6, 5, 9]]$ , what are **len(x)** and **len(x[0])**?

A. 3, 2

B. 3, 4

C. 1, 4

D. 2, 3

E. 2, 4

**Q1 answer: a**

2. Consider the following dictionary definition in python:

```
StuDict = {105: 'Kate', 97: 'Brittany', 20: 'Alice'}
```

Which of the following statements prints 'Brittany'?

- A. `print(StuDict)`
- B. `print(StuDict[1])`
- C. `print(StuDict[97])`
- D. `print(StuDict['Brittany'])`
- E. All of the above

**Q2 answer: c**

3. What is the output of the following python program?

```
print ([2*[k] for k in range(3) ] [2] [1])
```

A. 0

B. 1

C. 2

D. 3

E. IndexError: list index out of range

**Q3 answer: c**

4. How many times is the print statement executed?

```
for i in range(10):  
    for j in range(i):  
        print(i * j)
```

- A. 1
- B. 10
- C. 20
- D. 45
- E. 100

**Q4 answer: d**

5. What is the output of the following python program?

```
class Card:  
    def __init__(self , value):  
        self.value = value  
  
card1 = Card(10)  
card2 = Card(10)  
  
print( card1 == card2 )
```

A. True

B. False

**Q5 answer: b**

6. What is the output of the following python program?

```
class MyClass:  
    def MyFunction(self , value):  
        self.value = value  
        return 10/3
```

```
myObject = MyClass()  
temp = myObject.MyFunction(5)  
print(myObject.value)
```

- A. 3
- B. 3.33333333
- C. 5
- D. NameError: name 'value' is not defined
- E. NameError: name 'temp' is not defined

**Q6 answer: c**

7. What is the output of the following python program?

```
def meow():  
    print( 'Meow' )  
  
class Cat:  
    def __init__(self , color):  
        self.color = color  
        meow()  
        self.meow()  
  
    def meow(self):  
        print(self.color +': Meowww')  
  
cat = Cat( 'Black' )
```

- A. Meow  
Meow
- B. Black: Meowww  
Black: Meowww
- C. Meow  
Black: Meowww
- D. Black: Meowww  
Meow
- E. Error

**Q7 answer: c**

8. What is the output of the following python program?

```
class Dog:
    def __init__(self , name):
        self.name = name
        self.tricks = []
    def add_trick(self , trick):
        self.tricks.append(trick)
```

```
d = Dog('Fido')
e = Dog('Buddy')
d.add_trick('roll over')
e.add_trick('play dead')
print(d.tricks)
```

- A. 'roll over'
- B. 'play dead'
- C. [ 'roll over' ]
- D. [ 'play dead' ]
- E. [ 'roll over', 'play dead' ]

**Q8 answer: c**



9. Given the following assignment:

```
fun = [[ 'C' , 'i' , 's' , ["7" , "1" ] ] , [ 'S' ] , [ 'cs17' , '177' , 'f' ] , [ ( 'c' , 's' , 1 , 7 , 7 ) ] ]
```

Which of the following code snippets will display the string "cs177"?

```
I for i in range(len(fun [3][0])) :  
    print(fun [3][0][i] , end='')
```

II fun[3]

III fun[2][0]+fun [0][3][0]

IV fun [2][1]

A. I

B. I and II

C. I and III

D. I, II and III

E. The statement assigning a value to variable fun will result in an error message

**Q9 answer: c**

10. Which of the following is true about the process of Object Oriented Design (OOD)?
- A. OOD describes a system in terms of black boxes and interfaces
  - B. Client programs can use the functions as long as it understands what the function does.
  - C. OOD aims to define a useful set of classes for a given problem
  - D. OOD is an iterative process; it bounces back and forth between designing new classes and adding methods to existing classes.
  - E. All of the above

**Q10 answer: e**

11. What is the output of the following python program?

```
def theAnswer():  
    X = [4*[10] for j in range(7)]  
    Y = [3*['Arthur'] for j in range(len(X)-1)  
        ]  
    Z = [3*['Trillian'] for j in range(len(X)*  
        len(Y))]  
    print(len(Z))
```

theAnswer()

- A. 36
- B. 42
- C. 504
- D. 6804
- E. None of the above

**Q11 answer: b**

12. What is the output of the following python program?

```
def func(list):  
    if(len(list) < 3):  
        return False  
    status = True  
    for i in range(2, len(list)):  
        if (list[i] != list[i-1] + list[i-2]):  
            status = False  
    return status  
  
print(func([0,1,1,2,3,5,8,13]))
```

A. True

B. False

**Q12 answer: a**

13. What is the output of the following python program?

```
values = [[3, 4, 5, 1], [22, 8, 10, 15]]
```

```
v = values[0][0]
for lst in values:
    for element in lst:
        if v > element:
            v = element
print(v)
```

- A. 1
- B. 3
- C. 8
- D. 15
- E. 22

**Q13 answer: a**

14. What is the output of the following python program?

```
matrix = [[1, 2, 3, 4],  
          [4, 5, 6, 7],  
          [8, 9, 10, 11],  
          [12, 13, 14, 15]]  
  
for i in range(0, 4):  
    print(matrix[1][i], " ", end = " ")
```

A. 1 2 3 4

B. 2 5 9 13

C. 1 4 8 12

D. 4 5 6 7

E. 3 6 10 14

**Q14 answer: d**

15. What is the output of the following python program?

```
myList = [6, 5, 4, 3, 2, 1]
for i in range(1, 6):
    myList[i - 1] = myList[i]

for i in range(0, 6):
    print(myList[i], " ", end = " ")
```

A. 5 4 3 2 1 6

B. 5 4 3 2 1 1

C. 6 6 5 4 3 2

D. 1 6 5 4 3 2

E. 6 5 4 3 2 1

**Q15 answer: b**

16. What is the output of the following python program?

```
sumValue = 0
while(sumValue < 100):
    sumValue = sumValue*2 + 10
print(sumValue)
```

- A. 0
- B. 10
- C. 30
- D. 150
- E. 310

**Q16 answer: d**



17. What is the output of the following python program?

```
def main():  
    hours_worked = 20  
    wage = wage_calculator(hours_worked)  
    print(wage)
```

```
def wage_calculator(x):  
    if(x == 40):  
        return x*8  
    elif x < 40:  
        return x*8 - x*4  
    elif x > 40:  
        return x*8 + x*4
```

```
main()
```

- A. 80
- B. 100
- C. 320
- D. 576
- E. Error

**Q17 answer: a**

18. What is the output of the following python program?

```
def main():  
    x = 5  
    if(True):  
        x = x+1  
    print(x * "Python")
```

main()

- A. P
- B. Python
- C. PythonPythonPythonPythonPython
- D. PythonPythonPythonPythonPythonPython
- E. Compiler Error

**Q18 answer: d**

19. What is the output of the following python program?

```
number = 25
isPrime = True
i = 2
while i < number and isPrime:
    if number % i == 0:
        isPrime = False
    i += 1
print("i is", i, "isPrime is", isPrime)
```

- A. i is 5 isPrime is True
- B. i is 5 isPrime is False
- C. i is 2 isPrime is True
- D. i is 6 isPrime is True
- E. i is 6 isPrime is False

**Q19 answer: e**

20. Analyze the following statement:

```
sum = 0  
for d in range(0, 10, 0.1):  
    sum += sum + d
```

- A. The program has a syntax error because the range function cannot have three arguments.
- B. The program has a syntax error because the arguments in the range must be integers.
- C. The program has a syntax error with the use of +=
- D. The program runs in an infinite loop.
- E. The program runs fine.

**Q20 answer: b**

21. The following function is proposed to reverse a list. Does it do so correctly?

```
def rev(S):  
    n = len(S)  
    for k in range(n):  
        S[k], S[n-k-1] = S[n-k-1], S[k]
```

A. Yes

B. No

**Q21 answer: b**

22. What is the output of the following python program?

```
M = [[1,2]*3 for i in range(3)]  
print(M)
```

- A. []
- B. [[1, 2], [1, 2], [1, 2]]
- C. [[1, 2, 1, 2, 1, 2], [1, 2, 1, 2, 1, 2]]
- D. [[1, 2, 1, 2, 1, 2], [1, 2, 1, 2, 1, 2], [1, 2, 1, 2, 1, 2]]
- E. [[0, 0, 0, 0, 0, 0], [1, 1, 1, 1, 1, 1], [2, 2, 2, 2, 2, 2]]

**Q22 answer: d**

23. Which of the following python program will correctly calculate the factorial of the variable x?

A. **def** cal(x):  
    res = 1  
    **for** i **in** range(x):  
        res = res\*(i+1)  
    **return** res

B. **def** cal(x):  
    res = 1  
    **for** i **in** range(x+1):  
        res = res\*i  
    **return** res

C. **def** cal(x):  
    res = 0  
    **for** i **in** range(0, x+1):  
        res = res\*i  
    **return** res

D. **def** cal(x):  
    res = 0  
    **for** i **in** range(1, x+1):  
        res = res\*i  
    **return** res

E. **def** cal(x):  
    res = 1  
    **for** i **in** range(1, x):  
        res = res\*i  
    **return** res

**Q23 answer: a**



24. A nested int list is a list each of whose elements is an int or a nested int list. Examples: [1, 2, 3], [1, [ ]], [2, 3]], and [[ ]]. Which of the following functions returns the number of ints in a nested int list?

I .

```
def f (x) :  
    if x == [] :  
        return 0  
    elif isinstance(x, int) :  
        return 1  
    else :  
        return f(x[0]) + f(x[1:])
```

II .

```
def f (x) :  
    if isinstance(x, int) :  
        return 1  
    n = 0  
    for y in x :  
        n += f(y)  
    return n
```

III .

```
def f (x) :  
    if isinstance(x, int) :  
        return 1  
    else :  
        return f(x[0]) + f(x[1:])
```

A. I

B. II

C. III

D. I and II

E. I and III

**Q24 answer: d**

25. A binary tree can be represented by a list. An empty list is an empty tree. A list of length one is a leaf: the sole element is the root value. A list of length three is a larger tree: the first element is the root value, the second element is the left child, and the third element is the right child. For example, [1, [2], [3, [4], [5]]] is a tree whose root value is 1, whose left child is a leaf with value 2, and whose right child is a tree with root value 3, left child 4, and right child 5.

Which of the following functions returns the sum of the values of the nodes of a tree?

I .

```
def f (x) :  
    if x == [] :  
        return 0  
    elif len(x) == 1 :  
        return x[0]  
    else :  
        return x[0] + f(x[1]) + f(x[2])
```

II .

```
def f (x) :  
    n = 0  
    for y in x :  
        if y == x[0] :  
            n += y  
        else :  
            n += f(y)  
    return n
```

III .

```
def f (x) :  
    return g(x, 0)  
  
def g (x, n) :  
    if x == [] :  
        return n  
    elif len(x) == 1 :  
        return n + x[0]  
    else :  
        return g(x[1], g(x[2], n + x[0]))
```

- A. I
- B. II
- C. III
- D. All three
- E. None

**Q25 answer: d**