

**Beijing National Day School
Department of Mathematics**

AP Computer Science Principles

Test 1: Python Syntax and Strings

English Name: _____

Pinyin Name: _____

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Exam Record

Part1 _____ / 23 pts

Part2 _____ / 16 pts

Part3 _____ / 12 pts

Total: _____ / 51 pts

Grade: _____

Part I: Multiple Choice (23 points)

- Determine the answer to each of the following questions, using the available space for any necessary scratchwork.
- Decide which is the best of the choices given, and select the correct answer by placing an “X” in the corresponding box.

(1^{pt}) 1. Which of the following choices is a legal and legitimate Python variable name?

- 2bad4you
- calvin&hobbes
- year2000
- #hammertime

1 pt

(1^{pt}) 2. You would like to set up a variable called `ounces` that has the value 16. What simple Python statement will accomplish this?

- `ounces = 16`
- `16 = ounces`
- `def ounces(16):`
- `ounces(16)`

1 pt

(1^{pt}) 3. What does the following Python statement print out:

```
print("123" + "abc")
```

- "123" + "abc"
- This is a syntax error because you cannot add strings.
- 123+abc
- 123abc

1 pt

(1^{pt}) 4. In Python, the `float` data type is used to store:

- booleans
- decimal numbers
- strings
- integers

1 pt

(1^{pt}) 5. What is the result of the following Python statement:

```
print(42%10)
```

- 1042
- 420
- 4
- 2

1 pt

5 pts

(1^{pt}) **6.** Which of the following choices is the correct assignment statement for a **string** data type?

- greetings = [Hello]
- greetings = @Hello@
- greetings = "Hello"
- greetings = #Hello#

1 pt

(1^{pt}) **7.** What is the result of the following Python statement:

```
print(17/4)
```

- 4
- 4.0
- 4.3
- 4.25

1 pt

(1^{pt}) **8.** What are the only values that are permissible in Python's **boolean** data type?

- Yes, No
- On, Off
- Right, Wrong
- True, False

1 pt

(1^{pt}) **9.** Which of the following is a comment in Python?

- /* This is a test */
- // This is a test
- # This is a test
- % This is a test

1 pt

(1^{pt}) **10.** Which of the following elements of a mathematical expression in Python is evaluated first?

- Multiplication *
- Addition +
- Parenthesis ()
- Subtraction -

1 pt

(1^{pt}) **11.** What will be the value of x when the following statement is executed: x = int(98.6)

- 99
- 6
- 98
- 100

1 pt

(1^{pt}) **12.** What does the Python function **input()** do?

- Pause the program and read data from the user.
- Take a screen shot from an area of the screen.
- Read the memory of the running program.
- Connect to the network and retrieve a web page.

1 pt

7 pts

(1^{pt}) **13.** Which Python keyword indicates the start of a function definition?

- sweet
- def
- continue
- return

1 pt

(1^{pt}) **14.** Consider the following function definition:

```
def circlearea(radius):
```

In this context, what is the formal name for the variable radius?

1 pt

- expression
- logical deduction
- parameter
- condition

(1^{pt}) **15.** Which of the following is NOT a valid string method in Python?

- boldface()
- startswith()
- upper()
- strip()

1 pt

(1^{pt}) **16.** What does the following Python program print out?

```
str1 = "Hello"  
str2 = "there"  
greet = str1 + str2  
print(greet)
```

1 pt

- Hello there
- Hellothere
- there
- Hello

(1^{pt}) **17.** How would you use the index operator to print out the letter "q" from the following string?

```
x = "From marquard@uct.ac.za"
```

1 pt

- print(x[9])
- print(x[8])
- print(x[-1])
- print(x[q])

(1^{pt}) **18.** How would you use string slicing to print out "uct" from the following string?

```
x = "From marquard@uct.ac.za"
```

1 pt

- print(x[14+17])
- print(x[15:18])
- print(x[14:17])
- print(x[14:3])

6 pts

(1^{pt}) **19.** What is the iteration variable in the following Python code?

```
for letter in "banana":  
    print(letter)
```

- letter
- print
- in
- "banana"

1 pt

(1^{pt}) **20.** How would you print out the following string in all upper case in Python?

```
greet = "Hello there"  
 puts greet.ucase;  
 print($greet)  
 print(greet.upper())  
 console.log(greet.toUpperCase());
```

1 pt

(1^{pt}) **21.** What does the following Python program print out?

```
data = "From stephen.marquard@uct.ac.za"  
pos = data.find(".")  
print(data[pos:pos+3])  
 uct  
 mar  
 .ma  
 ste
```

1 pt

(1^{pt}) **22.** Consider the following string declaration:

```
grocery = "Mango"
```

Which of the following statements would cause an error(also known as a traceback)?

- dance = "T" + grocery[1:]
- person = grocery[:-2]
- several = grocery * 3
- grocery[0] = "T"

1 pt

(1^{pt}) **23.** Consider the following Python code:

```
lunch = "pizza"  
dinner = lunch[:]
```

Note that the **start** and **stop** indexes are omitted from the square bracket notation. What is the technical term for the outcome of this kind of string slicing?

- concatenation
- immutable
- clone
- iteration

1 pt

5 pts

Part II: Short Answer (16 points)

- Solve each of the following short answer questions. Write your solution in the corresponding box labelled, “Answer:”.

(1^{pt}) 1. What is the output of the following Python code:

```
print(3 > 4 or (2 < 3 and 9 > 10))
```

Answer:

1 pt

(1^{pt}) 2. What is the output of the following Python code:

```
lunch = "cheeseburgers"
```

```
print(lunch[6:12])
```

Answer:

1 pt

(1^{pt}) 3. What is the output of the following Python code:

```
breakfast = "pineapple"
```

```
print(breakfast[:4])
```

Answer:

1 pt

(1^{pt}) 4. What is the output of the following Python code:

```
flavor = "strawberry"
```

```
print(flavor[5:])
```

Answer:

1 pt

(1^{pt}) 5. What is the output of the following Python code:

```
icecream = "vanilla"
```

```
print(icecream[:])
```

Answer:

1 pt

(1^{pt}) 6. What is the output of the following Python code:

```
drink = "soda"
```

```
print(drink[:-1])
```

Answer:

1 pt

(1^{pt}) 7. What is the output of the following Python code:

```
beverage = "water"
```

```
print(beverage * 3)
```

Answer:

1 pt

(1^{pt}) 8. What is the output of the following Python code:

```
greetings = "Hello, world!"
```

```
newgreetings = "J" + greetings[1:]
```

```
print(newgreetings)
```

Answer:

1 pt

8 pts

- (1^{pt}) 9. What is the output of the following Python code:

```
print("cola" in "chocolate")
```

Answer:

1 pt

- (1^{pt}) 10. What is the output of the following Python code:

```
print("seed" in "banana")
```

Answer:

1 pt

- (1^{pt}) 11. What is the output of the following Python code:

```
fruit = "kiwi"  
bigfruit = fruit.upper()  
print(bigfruit)
```

Answer:

1 pt

- (1^{pt}) 12. What is the output of the following Python code:

```
citrus = "ORANGE"  
smallcitrus = citrus.lower()  
print(smallcitrus)
```

Answer:

1 pt

- (1^{pt}) 13. What is the output of the following Python code:

```
vegetable = "cauliflower"  
index = vegetable.find("u")  
print(index)
```

Answer:

1 pt

- (1^{pt}) 14. What is the output of the following Python code:

```
line = "Please have a nice day"  
print(line.startswith("Please"))
```

Answer:

1 pt

- (1^{pt}) 15. What is the output of the following Python code:

```
meal = "fresh pizza is the best pizza"  
print(meal.replace("pizza", "salad"))
```

Answer:

1 pt

- (1^{pt}) 16. What is the output of the following Python code:

```
def choose(x, y, z):  
    if x:  
        return y  
    else:  
        return z  
print(choose(False, 2, 3))
```

Answer:

1 pt

8 pts

Part III: Python Programming (12 points)

- Show all of your work. Remember that program segments are to be written in the Python programming language.

- (2^{pts}) 1. Assume that `sample` is a string of lower case text characters. Write a Python function that counts the number of vowels that are contained in the string `sample`. Valid vowels are: "a", "e", "i", "o", "u". Your function should be called:

```
def countvowels(sample):
```

The function should return an integer which is the total quantity of vowels in the string.

- If the following statements are executed:

```
result = countvowels("azcbobobegghakl")
print(result)
```

Then the output of your program should be: 5

```
def countvowels(sample):
    // YOUR CODE HERE
```

2 pts

2 pts

- (2pts) **2.** Write a Python function that takes in a string as a parameter, and generates a new string, which is made up of three copies of the last two characters of the original string. Your function should be called:

```
def extraend(word):
```

The function should return a string.

- If the following statements are executed:

```
result = extraend("hello")
print(result)
```

Then the output of your program should be: **lololo**

```
def extraend(word):
    // YOUR CODE HERE
```

2 pts

2 pts

- (4pts) **3.** In this question, you will write a Python function that performs the multiplication operation, but with a technique that the Ancient Egyptians used. The algorithm for Ancient Egyptian Multiplication can be expressed as follows. Assume that `grow` and `shrink` are the numbers to be multiplied together:

- Create an integer variable called `product` to hold the solution.
- Check to see if `shrink` is an odd number.
- If `shrink` is odd, then add the number `grow` to the variable `product`.
- Multiply the number `grow` by 2.
- Divide the number `shrink` by 2 (*Note:* Use integer division).
- Continue until the number `shrink` becomes zero.

Write a Python function that takes in two integer values, `grow` and `shrink`, as parameters, and calculates their multiplicative product using the Ancient Egyptian Multiplication algorithm. Your function should be called:

```
def multiply(grow, shrink):
```

Note: This function returns an integer value.

- If the following statements are executed:

```
result = multiply(23, 58)
print(result)
```

Then the output of your program should be: 1334

Write your solution on the next page.

4 pts

4 pts

```
def multiply(grow, shrink):  
    // YOUR CODE HERE
```

0 pts

- (4pts) 4. Pig Latin is a type of slang language that is easy to learn and understand. An English word can be translated into Pig Latin by following these two simple rules:

- If the English word begins with a vowel, then the corresponding Pig Latin word is generated by appending the letters "hay" to the end of the word. For example, "orange" becomes "orangehay".
- If the English word begins with a consonant, then the corresponding Pig Latin word is generated by moving the first letter to the end of the word, then appending the letters "ay". For example, "peach" becomes "eachpay".

Write a Python function that takes in an English word as a parameter, and translates that word to Pig Latin. Your function should be called:

```
def piglatin(word):
```

The function should return a string which is the Pig Latin translation of `word`.

- If the following statements are executed:

```
result = piglatin("orange")
print(result)
```

Then the output of your program should be: `orangehay`

- If the following statements are executed:

```
result = piglatin("peach")
print(result)
```

Then the output of your program should be: `eachpay`

Write your solution on the next page.

4 pts

4 pts

```
def piglatin(word):
    // YOUR CODE HERE
```

0 pts

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0 pts