Continuing Education Course #362
Python Programming for Engineers - Part 1:
Expressions, Data Types, Variables, Strings and Collections

1. What is the operating system of a computer?
○ a. Software and hardware that manage and coordinate the computer's memory, storage, processes, and all of the hardware components.
○ b. Software that manages and coordinates the computer's memory, storage, processes, and all of its software and hardware.
○ c. The hardware component of a computer that carries out the instructions by performing the basic operations such as data input, arithmetic, logic, and output of results.

2. Which of the following is NOT a classification of programming based on the approach to programming?
○ a. Event-driven programming
○ b. Machine language programming
○ c. Object-oriented programming

3. The Python programming language is
○ a. a high-level language
○ b. an interpreted language
○ c. All of the above.

4. In the Python programming language, a basic instruction is called
○ a. a variable
○ b. a statement
○ c. an expression

5. The basic data types in Python include
○ a. integer, Boolean, tuple
○ b. tuple, list, built-in function
○ c. complex number, string, float

6. In Python, a variable is created by
○ a. a declaration command that creates the variable
○ b. making up a variable name and assigned a value to it
○ c. a variable creation function

7. Which of the following will display the value of variable?
○ a. Pass the variable to the print command.
○ b. Call the variable's name directly.
○ c. All of the above.

8. Which of the following is an acceptable variable name?

- ○ a. account3_balance
- ○ b. Account*Balance3
- ○ c. 3Account_balance

9. Which of the following variable name conventions is required in Python?
- ○ a. A three letter prefix indicating the variable type and using camel case.
- ○ b. A prefix of any number of characters and using either pascal case or snake case.
- ○ c. None of the above.

10. Given the string,

```
str_var = 'Python for Engineers'
```

The value of `str_var[13]` is
- ○ a. 'g'
- ○ b. 'n'
- ○ c. 'E'

11. Given the string,

```
str_var = 'Python for Engineers'
```

The value of `str_var[-7]` is
- ○ a. `'g'`
- ○ b. `'i'`
- ○ c. None of the above, invalid index.

12. Given the string,

```
str_var = 'Python for Engineers'
```

The string slice `str_var [11:17]` will yield
- ○ a. `'Engine'`
- ○ b. `'Enginee'`
- ○ c. `'Engineer'`

13. Given the code,

```
str_var = 'Python for Engineers'
x = len(str_var)
```

The value of x is
- ○ a. 19
- ○ b. 20
- ○ c. None of the above

14. Given the code,

```
str_var = 'python for Engineers'
y = str_var .capitalize( )
```

The value of `y` is

○ a. `'Python for Engineers'`
○ b. `'Python for engineers'`
○ c. `'PYTHON for eNGINEERS'`

15. Given the code,

```
str_var = 'for Engineers'
z = f'Python Programming {str_var}' # no space after the f
```

The value of `z` is
○ a. `'Python Programming for Engineers'`
○ b. `'Programming Python for Engineers'`
○ c. `'Python Programming FOR ENGINEERS'`

16. Given the code,

```
city_list1 = ['Tampa', 'Jacksonville', 'Orlando', 'Miami']
city_list2 = ['Gainesville', 'Pensacola', 'Fort Lauderdale']
city_list1[2] = city_list2
print(city_list1)
```

The output shall be
○ a. `['Tampa', 'Jacksonville', ['Gainesville', 'Pensacola', 'Fort Lauderdale'], 'Miami']`
○ b. `['Tampa', 'Jacksonville', 'Gainesville', 'Pensacola', 'Fort Lauderdale', 'Miami']`
○ c. `['Tampa', 'Jacksonville', ['Gainesville', 'Pensacola', 'Fort Lauderdale']]`

17. Given the code,

```
states1 = ['Georgia', 'Tennessee', 'Florida', 'South Carolina']
states2 = ['Louisiana', 'Alabama']
states1.insert(2, states2)
print(states1)
```

The output shall be
○ a. `['Georgia', 'Tennessee', ['Louisiana', 'Alabama'], 'South Carolina']`
○ b. `['Georgia', 'Tennessee', ['Louisiana', 'Alabama'], 'Florida', 'South Carolina']`
○ c. `['Georgia', 'Tennessee', ['Louisiana', 'Alabama', 'Florida'], 'South Carolina']`

18. Given the code,

```
m_constants = (3.142, 2.718, 9.81, 273)
m_constants[2] = 0.577
print( m_constants )
```

The output shall be
○ a. `(3.142, 2.718, 0.577, 9.81, 273)`
○ b. `(3.142, 2.718, 0.577, 273)`
○ c. None of the above

19. Given the code,

```
m_constants = (3.142, 2.718, 9.81, 273)
print( m_constants[3] )
```

The output shall be

- ○ a. 273
- ○ b. 9.81
- ○ c. None of the above, the tuple will cause the program to crash

20. Given the code,

```
p_constants = {
'pi' : 3.142,
'e' : 2.718,
'g' : 9.81,
'Kelvin' : 273 }

print( p_constants.values( ) )
```

The output shall be

- ○ a. `[3.142, 2.718, 9.81, 273]`
- ○ b. `(3.142, 2.718, 9.81, 273)`
- ○ c. `['pi', 'e', 'g', 'Kelvin']`

21. Given the code,

```
p_constants = {
'pi' : 3.142,
'e' : 2.718,
'g' : 9.81,
'Kelvin' : 273 }
```

Which of the following will change the value of an item of the dictionary `p_constants`?

- ○ a. `p_constants['g'] = 32.174`
- ○ b. `p_constants[2] = 32.174`
- ○ c. All of the above

22. Given the code,

```
road_contractors = { 'James Inc', 'FHI LLC', 'Kirk Contracting', 'Patel
Brothers', 'Ritt LLC'}
striping_contractors = { 'Myers & Hill', 'Facol Roads Inc', 'Ritt LLC', 'Kirk
Contracting'}
streetlight_contractors = {'Patel Brothers', 'FHI LLC', 'Facol Roads Inc', 'Swan
LLC'}

print( road_contractors.difference(striping_contractors,
streetlight_contractors) )
```

The output shall be the following set of items in any order

- ○ a. `{'James Inc'}`
- ○ b. `{'Kirk Contracting', 'FHI LLC', 'Ritt LLC', 'Facol Roads Inc'}`
- ○ c. `{ 'James Inc', 'FHI LLC', 'Kirk Contracting', 'Patel Brothers', 'Ritt LLC'}`

23. Given the code,

```
road_contractors = { 'James Inc', 'FHI LLC', 'Kirk Contracting', 'Patel
Brothers', 'Ritt LLC'}
striping_contractors = { 'Myers & Hill', 'Facol Roads Inc', 'Ritt LLC', 'Kirk
Contracting'}
streetlight_contractors = {'Patel Brothers', 'FHI LLC', 'Facol Roads Inc', 'Swan
LLC'}

print( road_contractors.union(streetlight_contractors) )
```

The output shall be the following set of items in any order

○ a. `{ 'James Inc', 'FHI LLC', 'Kirk Contracting', 'Patel Brothers', 'Ritt LLC', 'Facol Roads Inc', 'Swan LLC'}`

○ b. `{ 'Patel Brothers', 'James Inc', 'FHI LLC', 'Kirk Contracting', 'FHI LLC', 'Patel Brothers', 'Ritt LLC', 'Facol Roads Inc', 'Swan LLC'}`

○ c. `{'Patel Brothers', 'FHI LLC'}`

24. The purpose of comment lines in a script is

○ a. to notify the Python interpreter of impending tasks so that the necessary computer resources can be optimized

○ b. to enable the Python interpreter notify the computer's operating system on the need to reserve computer resources for the efficient execution of the program

○ c. for the programmer to provide personal notes and reminders regarding to the code

25. A Python script may be executed

○ a. by any of the Python interpreters that may be downloaded from the web

○ b. through the Windows Command Prompt provided a Python interpreter has been installed on the computer

○ c. All of the above.