PCEP – Certified Entry-Level Python Programmer Certification: Exam Syllabus

Exam block #1: Basic Concepts (17%)

Objectives covered by the block (5 exam items)

- fundamental concepts: interpreting and the interpreter, compilation and the compiler, language elements, lexis, syntax and semantics, Python keywords, instructions, indenting
- literals: Boolean, integer, floating-point numbers, scientific notation, strings
- comments
- the print() function
- the input() function
- numeral systems (binary, octal, decimal, hexadecimal)
- numeric operators: **** * / % // + –**
- string operators: *** +**
- assignments and shortcut operators

Exam block #2: Data Types, Evaluations, and Basic I/O Operations (20%)

Objectives covered by the block (6 exam items)

- operators: unary and binary, priorities and binding
- bitwise operators: **~ & ^ | << >>**
- Boolean operators: **not and or**
- Boolean expressions
- relational operators (**== != > >= < <=**), building complex Boolean expressions
- accuracy of floating-point numbers
- basic input and output operations using the **input()**, **print()**, **int()**, **float()**, **str(), len()** functions
- formatting **print()** output with **end=** and **sep=** arguments
- type casting
- basic calculations
- simple strings: constructing, assigning, indexing, slicing comparing, immutability

Exam block #3: Flow Control – loops and conditional blocks (20%)

Objectives covered by the block (6 exam items)

- conditional statements: **if**, **if-else**, **if-elif**, **if-elif-else**
- multiple conditional statements
- the **pass** instruction
- building loops: **while**, **for**, **range()**, **in**
- iterating through sequences
- expanding loops: **while-else**, **for-else**
- nesting loops and conditional statements
- controlling loop execution: **break**, **continue**

Exam block #4: Data Collections – Lists, Tuples, and Dictionaries (23%)

Objectives covered by the block (7 exam items)

- simple lists: constructing vectors, indexing and slicing, the **len()** function
- lists in detail: indexing, slicing, basic methods (**append()**, **insert()**, **index()**) and functions (**len()**, **sorted()**, etc.), **del** instruction, iterating lists with the **for** loop, initializing, **in** and **not in** operators, list comprehension, copying and cloning
- lists in lists: matrices and cubes
- tuples: indexing, slicing, building, immutability
- tuples vs. lists: similarities and differences, lists inside tuples and tuples inside lists
- dictionaries: building, indexing, adding and removing keys, iterating through dictionaries as well as their keys and values, checking key existence, **keys()**, **items()** and **values()** methods
- strings in detail: ASCII, UNICODE, UTF-8, immutability, escaping using the **** character, quotes and apostrophes inside strings, multiline strings, copying vs. cloning, advanced slicing, string vs. string, string vs. non-string, basic string methods (**upper()**, **lower()**, **isxxx()**, **capitalize()**, **split()**, **join()**, etc.) and functions (**len()**, **chr()**, **ord()**), escape characters

Exam block #5: Functions (20%)

Objectives covered by the block (6 exam items)

- defining and invoking your own functions and generators
- **return** and **yield** keywords, returning results,
- the **None** keyword,
- recursion
- parameters vs. arguments,
- positional keyword and mixed argument passing,
- default parameter values
- converting generator objects into lists using the **list()** function
- name scopes, name hiding (shadowing), the **global** keyword

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