Beginner-Level Python MCQs

1. **Which of the following is the correct syntax to print "Hello, World!" in Python?**
   a) `print("Hello, World!")`
   b) `echo "Hello, World!"`
   c) `printf("Hello, World!")`
   d) `cout << "Hello, World!";`
   Answer: a) `print("Hello, World!")`
   Explanation: The `print()` function is used in Python to display output. Other options use syntax from other programming languages.

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2. **What is the result of the expression `3 + 5 * 2` in Python?**
   a) 13
   b) 16
   c) 10
   d) 20
   Answer: a) 13
   Explanation: Python follows the order of operations (PEMDAS). Multiplication (`5 * 2 = 10`) is done before addition (`3 + 10 = 13`).

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3. **Which keyword is used to define a function in Python?**
   a) `function`
   b) `def`
   c) `func`
   d) `define`
   Answer: b) `def`
   Explanation: The `def` keyword is used in Python to define a function. Syntax: `def function_name():`.

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4. **What is the output of `type(5.0)`?**
   a) `int`
   b) `float`
   c) `double`
   d) `decimal`
   Answer: b) `float`
   Explanation: Numbers with a decimal point are considered floating-point numbers in Python.

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5. **Which of the following data types is mutable in Python?**
   a) Tuple
   b) List
   c) String
   d) Integer
   Answer: b) List
   Explanation: Lists in Python are mutable, meaning their elements can be modified after creation.

Intermediate-Level Python MCQs

6. **What will be the output of `print(bool(0))`?**
   a) `True`
   b) `False`
   c) `0`
   d) `None`
   Answer: b) `False`
   Explanation: In Python, `0` is considered `False` in a boolean context.

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7. **How do you create a dictionary in Python?**
   a) {}
   b) []
   c) ()
   d) <>
   Answer: a) {}
   Explanation: Dictionaries are created using curly braces, e.g., `my_dict = {"key": "value"}`.

What is the output of the following code?
python
########## Code Here ##########
```
x = [1, 2, 3]
print(x[3])
```

8. a) 1
   b) 3
   c) `IndexError`
   d) `None`
   Answer: c) `IndexError`

Explanation: Python lists are zero-indexed. `x[3]` tries to access the fourth element, which doesn't exist.

What does the following code return?
python
######### Code Here ##########
```
'Python'.upper()
```

9. a) `PYTHON`
   b) `python`
   c) `Python`
   d) `Error`
   Answer: a) `PYTHON`
   Explanation: The `upper()` method converts all characters in a string to uppercase.

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10. **Which of the following is NOT a Python keyword?**
    a) `pass`
    b) `assert`
    c) `lambda`
    d) `loop`
    Answer: d) `loop`
    Explanation: Python does not have a `loop` keyword. Keywords like `for` and `while` are used for loops.

Advanced-Level Python MCQs

What is the output of the following code?
python
######### Code Here ##########
```
def add(a, b):
    return a + b
print(add(1, 2, 3))
```

11. a) `6`
    b) `3`
    c) `TypeError`
    d) `None`
    Answer: c) `TypeError`
    Explanation: The `add()` function is defined to take two arguments, but three are passed.

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12. **Which module is used to generate random numbers in Python?**
    a) `math`
    b) `random`
    c) `os`
    d) `sys`
    Answer: b) `random`
    Explanation: The `random` module provides functions like `randint()` and `random()` to generate random numbers.

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13. **What is the time complexity of accessing an element in a Python dictionary?**
    a) O(1)
    b) O(n)
    c) O(log n)
    d) O(n^2)
    Answer: a) O(1)
    Explanation: Dictionaries in Python use a hash table, providing average-case constant time complexity for lookups.

What does the following code do?
python
######### Code Here ##########
```
with open('file.txt', 'r') as f:
    data = f.read()
```

14. a) Reads the contents of a file into `data`.
    b) Writes data to a file.
    c) Deletes the file.
    d) Appends data to the file.
    Answer: a) Reads the contents of a file into `data`.
    Explanation: The `with` statement ensures the file is opened in read mode (`'r'`) and automatically closed after reading.

What is the result of the following code?
python
######### Code Here ##########
```
import math
print(math.floor(3.7))
```

15. a) 4
    b) 3

c) `3.7`
d) `Error`
Answer: b) 3
Explanation: The `math.floor()` function rounds a number down to the nearest integer.

Basic-Level Python MCQs (16–30)

16. What is the correct way to declare a variable in Python?
a) `int x = 10`
b) `x = 10`
c) `var x = 10`
d) `x: int = 10`
Answer: b) `x = 10`
Explanation: Python variables are dynamically typed and don't require type declarations.

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17. What does the `range(5)` function return?
a) `[0, 1, 2, 3, 4, 5]`
b) `[1, 2, 3, 4, 5]`
c) `[0, 1, 2, 3, 4]`
d) `None`
Answer: c) `[0, 1, 2, 3, 4]`
Explanation: The `range(n)` function generates numbers from `0` to `n-1`.

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18. Which of these operators is used for exponentiation in Python?
a) `^`
b) `**`
c) `exp()`
d) `power()`
Answer: b) `**`
Explanation: The `**` operator is used to calculate powers, e.g., `2**3 = 8`.

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19. What is the output of the following code?

python
######### Code Here ##########
`a = 10`

```
b = 20
a, b = b, a
print(a, b)
```

a) `20 10`
b) `10 20`
c) `Error`
d) `None`
Answer: a) `20 10`
Explanation: Python allows swapping variables in a single line: `a, b = b, a`.

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20. What is the output of `len("Python")`?
a) `5`
b) `6`
c) `7`
d) `Error`
Answer: b) `6`
Explanation: The `len()` function counts the number of characters in a string, including spaces.

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21. Which loop is used when the number of iterations is not known?
a) `for`
b) `while`
c) `do-while`
d) `foreach`
Answer: b) `while`
Explanation: The `while` loop is used when the condition depends on runtime input.

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22. What does the following code return?

python
######### Code Here ##########
```
x = [1, 2, 3]
print(x[-1])
```

a) 3
b) 1

c) `IndexError`
d) `None`
Answer: a) 3
Explanation: Negative indexing in Python accesses elements from the end of a list.

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23. Which function is used to check the data type of a variable in Python?
a) `is()`
b) `typeof()`
c) `check()`
d) `type()`
Answer: d) `type()`
Explanation: The `type()` function returns the data type of an object, e.g., `type(5)` returns `<class 'int'>`.

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24. What will `print("Hello" * 3)` output?
a) `HelloHelloHello`
b) `Hello Hello Hello`
c) `Error`
d) `None`
Answer: a) `HelloHelloHello`
Explanation: In Python, multiplying a string by an integer repeats the string.

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25. Which of the following is a valid list in Python?
a) `[1, 2, "hello"]`
b) `1, 2, 3`
c) `{1, 2, 3}`
d) `(1, 2, 3)`
Answer: a) `[1, 2, "hello"]`
Explanation: Lists in Python are enclosed in square brackets and can contain mixed data types.

Intermediate-Level Python MCQs (31–45)

31. What does the following code output?

python
########## Code Here ##########
`x = "python"`

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

a) nohtyp
b) python
c) Error
d) None
Answer: a) nohtyp
Explanation: Slicing with `[::-1]` reverses the string.

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32. How do you handle exceptions in Python?
a) `try-catch`
b) `try-except`
c) `throw-catch`
d) `try-finally`
Answer: b) `try-except`
Explanation: Python uses `try` and `except` blocks to handle exceptions.

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33. Which of the following can be used to delete a key-value pair from a dictionary?
a) `del`
b) `pop()`
c) Both a and b
d) None
Answer: c) Both a and b
Explanation: The `del` statement and `pop()` method can remove items from a dictionary.

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34. What is the output of the following?

python
########## Code Here ##########
```
a = {1, 2, 3}
b = {2, 3, 4}
print(a & b)
```

a) `{1, 2, 3, 4}`
b) `{2, 3}`
c) `{}`
d) `Error`

Answer: b) `{2, 3}`
Explanation: The & operator finds the intersection of two sets.

Advanced-Level Python MCQs (46–55)

46. What is a Python decorator?
a) A tool to modify class variables
b) A function that modifies another function
c) A special type of comment
d) A function to optimize code
Answer: b) A function that modifies another function
Explanation: A decorator is a higher-order function that takes another function as input and returns a modified version.

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47. What is the purpose of the `yield` keyword?
a) Pause and resume a generator function
b) Return multiple values
c) Create a function without `return`
d) None of the above
Answer: a) Pause and resume a generator function
Explanation: `yield` is used in generator functions to produce values lazily.

Intermediate-Level Python MCQs (35–45)

35. What does the following code return?

python
########## Code Here ##########
```
x = [1, 2, 3, 4]
print(x[1:3])
```

a) `[1, 2]`
b) `[2, 3]`
c) `[2, 3, 4]`
d) `Error`
Answer: b) `[2, 3]`
Explanation: Slicing `[1:3]` includes elements at index 1 and 2 (start is inclusive, end is exclusive).

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36. Which of the following methods adds an element to the end of a list?

a) `append()`
b) `add()`
c) `insert()`
d) `extend()`
Answer: a) `append()`
Explanation: The `append()` method adds an element to the end of a list.

---

37. What is the output of the following code?

python
######### Code Here ##########
```
print(2 ** 3 ** 2)
```

a) 64
b) 512
c) 256
d) Error
Answer: b) 512
Explanation: Python evaluates exponents from right to left (`3**2 = 9`, `2**9 = 512`).

---

38. What is the result of the following?

python
######### Code Here ##########
```
list1 = [1, 2, 3]
list2 = list1
list2[0] = 0
print(list1)
```

a) `[1, 2, 3]`
b) `[0, 2, 3]`
c) Error
d) None
Answer: b) `[0, 2, 3]`
Explanation: Both `list1` and `list2` point to the same memory location, so changes to one reflect in the other.

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39. What is the output of this code?

python
######### Code Here ##########
```
x = [i for i in range(5)]
print(x)
```

a) `[1, 2, 3, 4, 5]`
b) `[0, 1, 2, 3, 4]`
c) `[0, 1, 2, 3, 4, 5]`
d) None
Answer: b) `[0, 1, 2, 3, 4]`
Explanation: The list comprehension `[i for i in range(5)]` generates numbers from `0` to 4.

---

40. Which of the following is a valid Python function?
a)

python
######### Code Here ##########
```
def 1function():
    pass
```

b)

python
######### Code Here ##########
```
def function-name():
    pass
```

c)

python
######### Code Here ##########
```
def function_name():
    pass
```

d)

python

######### Code Here ##########
```
def function name():
    pass
```

Answer: c)

python
######### Code Here ##########
```
def function_name():
    pass
```

Explanation: Function names in Python must start with a letter or underscore and can include letters, numbers, and underscores only.

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41. What is the purpose of `is` in Python?
a) To compare memory locations
b) To compare values
c) To test membership in a list
d) To test truthiness of a variable
Answer: a) To compare memory locations
Explanation: The `is` operator checks whether two variables point to the same memory location.

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42. What will the following code output?

python
######### Code Here ##########
```
for i in range(3):
    print(i, end=", ")
```

a) `0, 1, 2`
b) `0, 1, 2,`
c) `012`
d) `Error`
Answer: b) `0, 1, 2,`
Explanation: The `end` parameter of `print()` specifies what to append after each print, which in this case is `", "`.

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43. How do you convert a tuple to a list in Python?
a) `tuple()`
b) `to_list()`
c) `list()`
d) `convert()`
Answer: c) `list()`
Explanation: The `list()` function converts a tuple or other iterable into a list.

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44. Which of these is not a valid Python data type?
a) `list`
b) `set`
c) `array`
d) `tuple`
Answer: c) `array`
Explanation: Python does not have a built-in `array` data type, though it has the `array` module.

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45. What is the output of this code?

python
######### Code Here ##########
`print(10 // 3)`

a) `3.3333`
b) 3
c) 4
d) `Error`
Answer: b) 3
Explanation: The `//` operator performs floor division, returning the integer part of the quotient.

Advanced-Level Python MCQs (48–55)

48. Which of these best describes a Python generator?
a) A function that uses `yield`
b) A function that returns all results at once
c) A special type of list
d) A module for generating random numbers
Answer: a) A function that uses `yield`

Explanation: A generator is created using the `yield` keyword, allowing iteration without storing the entire result in memory.

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49. What does the `@staticmethod` decorator do?
a) Makes a method private
b) Allows a method to be called without an instance
c) Makes a method mutable
d) None of the above
Answer: b) Allows a method to be called without an instance
Explanation: `@staticmethod` makes a method accessible via the class name, without needing an object instance.

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50. Which library in Python is used for data manipulation?
a) `numpy`
b) `pandas`
c) `matplotlib`
d) `scikit-learn`
Answer: b) `pandas`
Explanation: `pandas` is specifically designed for data manipulation and analysis.

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51. What is the difference between `is` and ==?
a) `is` compares memory locations, == compares values
b) Both compare values
c) Both compare memory locations
d) None of the above
Answer: a) `is` compares memory locations, == compares values
Explanation: The `is` operator checks if two variables refer to the same object, while == checks for equality in value.

---

52. What is the output of this code?

python
######### Code Here ##########
```
print([i**2 for i in range(3)])
```

a) `[1, 4, 9]`
b) `[0, 1, 4]`
c) `[1, 4, 9, 16]`

d) `Error`
Answer: b) `[0, 1, 4]`
Explanation: The list comprehension `[i**2 for i in range(3)]` squares numbers from `0` to 2.

---

53. How do you handle file I/O errors in Python?
a) `try-finally`
b) `try-except`
c) `try-catch`
d) `Error handling is automatic`
Answer: b) `try-except`
Explanation: File I/O errors, like file not found, can be caught using a `try-except` block.

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54. Which of these is an immutable Python data type?
a) `list`
b) `dictionary`
c) `set`
d) `string`
Answer: d) `string`
Explanation: Strings are immutable in Python; they cannot be changed after creation.

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55. What is the purpose of the `os` module in Python?
a) Perform mathematical operations
b) Interact with the operating system
c) Create graphical user interfaces
d) Work with databases
Answer: b) Interact with the operating system
Explanation: The `os` module provides functions for file operations, environment variables, and interacting with the operating system.