Python Fundamentals: Practice Questions

Section 1: Data and Variables

Multiple Choice Questions

1. What is data in the context of programming? a) Only numbers and calculations b) Collection of information gathered by observations, measurements, research or analysis c) Only text and strings d) Computer hardware components
2. Which of the following is NOT an example of data in everyday life? a) Sending a WhatsApp message b) Posting a photo on Facebook c) The physical smartphone device d) Clicking on a website link
3. What are variables used for in programming? a) To make programs look complicated b) To store data temporarily for performing operations c) To slow down program execution d) To replace the need for data types

True/False Questions

4. Variables in Python can store different types of data. (True/False)
5. All programming languages have the same variable naming rules. (True/False)
6. Data is only numerical information. (True/False)

Section 2: Variable Naming Rules

Multiple Choice Questions

7. Which of the following is a VALID variable name in Python? a) 1name b) @username c) _user_name d) user name
8. Which variable name would cause a syntax error? a) userName b) user_name c) _name d) name*
9. Are the variables `Student` and `student` the same in Python? a) Yes, Python is case-insensitive b) No, Python is case-sensitive c) Only if they're assigned the same value d) It depends on the data type

Fill in the Blanks

10. Variables in Python are _____ sensitive, meaning `Age` and `age` are treated as different variables.
11. Variable names cannot start with a _____ but can start with an underscore.
12. The only special character allowed in variable names (besides underscore) is _____.

Section 3: Python Features

Multiple Choice Questions

13. What is dynamic typing in Python? a) Variables can only store one type of data b) You must declare variable types before using them c) Python automatically detects data types without explicit declaration d) All variables are strings by default
14. What is dynamic binding in Python? a) Variables cannot change their values b) Variables can change both values and data types during execution c) Variables are permanently bound to memory d) Variables must be declared before use
15. Why might dynamic typing make Python slower than other languages? a) It uses more memory b) It requires more code to write c) The interpreter needs to check data types during execution d) It doesn't support mathematical operations

Short Answer Questions

16. Explain the difference between dynamic typing and static typing.
17. Give an example of dynamic binding in Python.

Section 4: Data Types

Multiple Choice Questions

18. Which of the following is NOT a built-in data type in Python? a) Integer (int) b) String (str) c) Boolean (bool) d) Character (char)
19. What data type would the value `3.14` be in Python? a) Integer b) Float c) String d) Boolean
20. Which values can a Boolean data type hold? a) 0 and 1 b) True and False c) Yes and No d) On and Off

Matching Questions

21. Match the data type with its example:

- Integer: _____
- Float: _____
- String: _____
- Boolean: _____

Options: `True`, `"Hello"`, `3.14`, `42`

Section 5: Arithmetic Operators

Multiple Choice Questions

22. What is the result of `15 // 4` in Python? a) 3.75 b) 3 c) 4 d) 3.0

23. What does the modulus operator (%) return? a) The quotient of division b) The remainder of division c) The larger of two numbers d) The power of a number
24. Which operator is used for exponentiation in Python? a) ^ b) ** c) exp d) pow

Problem Solving

25. If `a = 10` and `b = 3`, what would be the result of:

- `a + b` = _____
- `a - b` = _____
- `a * b` = _____
- `a / b` = _____
- `a // b` = _____
- `a % b` = _____
- `a ** b` = _____

26. What is the order of operations in Python? List the sequence.

Section 6: Assignment Operators

Multiple Choice Questions

27. What does the assignment operator (=) do? a) Compares two values b) Assigns a value to a variable c) Performs mathematical addition d) Checks if values are equal
28. Which of the following demonstrates multiple assignment? a) `a = 5; b = 5; c = 5` b) `a = b = c = 5` c) `a, b, c = 5` d) `a = 5 + b + c`

Short Answer Questions

29. Explain the difference between assignment and comparison operators.
30. What is unpacking in Python assignment? Give an example.

Section 7: Comparison Operators

Multiple Choice Questions

31. What is the result of `5 == 5.0` in Python? a) True b) False c) Error d) None
32. Which operator checks if two values are NOT equal? a) <> b) != c) not= d) =/=
33. What type of value do comparison operators return? a) Integer b) Float c) String d) Boolean

Problem Solving

34. Evaluate the following expressions (True/False):

- `10 > 5` = _____
- `3 >= 3` = _____
- `7 < 4` = _____
- `8 <= 8` = _____
- `5 == 5` = _____
- `6 != 6` = _____

Section 8: Logical Operators

Multiple Choice Questions

35. What is the result of `True and False`? a) True b) False c) Error d) None
36. What is the result of `True or False`? a) True b) False c) Error d) None
37. What is the result of `not True`? a) True b) False c) Error d) None

Truth Tables

38. Complete the truth table for AND operator:

- `True and True` = _____
- `True and False` = _____
- `False and True` = _____
- `False and False` = _____

39. Complete the truth table for OR operator:

- `True or True` = _____
- `True or False` = _____
- `False or True` = _____
- `False or False` = _____

Complex Expressions

40. Evaluate: `(5 > 3) and (4 < 6)` = _____
41. Evaluate: `(2 > 5) or (3 < 4)` = _____
42. Evaluate: `not (5 == 5)` = _____

Section 9: Membership Operators

Multiple Choice Questions

43. What does the `in` operator do? a) Assigns values to variables b) Checks if a value exists in a sequence c) Performs mathematical operations d) Compares two values
44. What would `"a" in "apple"` return? a) True b) False c) Error d) "a"
45. What would `5 not in [1, 2, 3, 4]` return? a) True b) False c) Error d) 5

Problem Solving

46. Given the list `fruits = ["apple", "banana", "cherry"]`, evaluate:

- `"banana" in fruits` = _____
- `"orange" in fruits` = _____
- `"grape" not in fruits` = _____

Section 10: Identity Operators

Multiple Choice Questions

47. What is the difference between `==` and `is` operators? a) There is no difference b) `==` compares values, `is` compares memory locations c) `==` compares memory locations, `is` compares values d) `is` is used for strings only
48. If two variables have the same value but different memory locations, what would `==` and `is` return? a) Both return True b) Both return False c) `==` returns True, `is` returns False d) `==` returns False, `is` returns True

Conceptual Questions

49. Explain why two variables can have equal values but different memory locations.
50. When would you use `is` instead of `==`?

Section 11: Memory Management

Multiple Choice Questions

51. What function is used to find the memory address of a variable in Python? a) address() b) memory() c) id() d) location()
52. What function is used to check the data type of a variable? a) datatype() b) type() c) check() d) typeof()

Section 12: Comprehensive Questions

Scenario-Based Questions

53. You are creating a program to store student information. What data types would you use for:

- Student name: _____
- Student age: _____
- Student grade (A, B, C, etc.): _____
- Student GPA: _____
- Is student enrolled: _____

54. Identify the errors in these variable names and explain why they're invalid:

- `2student`
- `student-name`
- `@email`
- `student name`

Problem Solving

55. Write the order of operations for this expression: `2 + 3 * 4 ** 2 / 2 - 1`

56. Explain why this code might cause confusion:

```
student = "John"
Student = "Jane"
```

57. A programmer writes: `if name = "John":` What's wrong with this code and how should it be corrected?

Answer Key

Note: This section would contain all the correct answers for self-assessment

Section 1: 1-b, 2-c, 3-b, 4-True, 5-False, 6-False

Section 2: 7-c, 8-d, 9-b, 10-case, 11-digit, 12-none

Section 3: 13-c, 14-b, 15-c

Section 4: 18-d, 19-b, 20-b, 21-Integer:42, Float:3.14, String:"Hello", Boolean:True

Section 5: 22-b, 23-b, 24-b, 25-a+b=13, a-b=7, a*b=30, a/b=3.33, a//b=3, a%b=1, ab=1000**

Section 6: 27-b, 28-b

Section 7: 31-a, 32-b, 33-d, 34-True, True, False, True, True, False

Section 8: 35-b, 36-a, 37-b, 38-True, False, False, False, 39-True, True, True, False, 40-True, 41-True, 42-False

Section 9: 43-b, 44-a, 45-a, 46-True, False, True

Section 10: 47-b, 48-c

Section 11: 51-c, 52-b

Section 12: 53-String, Integer, String, Float, Boolean

Study Tips

1. **Practice Regularly**: Work through these questions multiple times
2. **Understand, Don't Memorize**: Focus on understanding concepts rather than memorizing answers
3. **Create Your Own Examples**: Make up your own scenarios to test each concept
4. **Use Multiple Resources**: Supplement with online tutorials and documentation
5. **Test Your Knowledge**: Try to explain concepts to others or write them out in your own words