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Class	10th	Chapter	03
Subject	Computer Science	Board	Punjab

CHAPTER 03: Introduction to Python Programming

EXERCISE SOLUTIONS

Multiple Choice Questions (MCQs)

1. Which of the following steps is NOT part of the basic programming process?

(a) Write Code (b) Compile/Interpret (c) Execute (d) Ignore Errors

Correct Answer: (d) Ignore Errors

2. What should you do when installing Python to run it from the command line more easily?

(a) Uncheck "Add Python to PATH" (b) Choose a different IDE (c) Check "Add Python to PATH" (d) Install only the IDE

Correct Answer: (c) Check "Add Python to PATH"

3. What will be the output of: print(10 // 3)?

(a) 3.333 (b) 3 (c) 1 (d) 4

Correct Answer: (b) 3

4. What does the input() function return?

(a) Integer (b) Float (c) String (d) Boolean

Correct Answer: (c) String

5. Which operator has the highest precedence in Python?

(a) Addition (+) (b) Multiplication (*) (c) Exponentiation () (d) Parentheses ()

Correct Answer: (d) Parentheses ()

6. What is the result of 5 > 3 and 2 < 1?

(a) True (b) False (c) Error (d) None

Correct Answer: (b) False

7. What does the += operator do?

(a) Adds two numbers (b) Compares values (c) Adds and assigns (d) Multiplies values

Correct Answer: (c) Adds and assigns

8. Which function converts string to integer?

(a) str() (b) int() (c) float() (d) input()

Correct Answer: (b) int()

9. What is the output of the below code?

age = 25; print ("Age : ", age)

(a) Age: 25 (b) 25 (c) Age (d) age

Correct Answer: (a) Age : 25

10. Which symbol is used for comments in Python?

(a) // (b) / (c) # (d) --*

Correct Answer: (c) #

Short Answer Questions

1. Why are comments important in programming?

Answer:

Comments are non-executable notes added to source code. They are important because:

- They explain the purpose and logic of the code, making it readable and understandable for developers.
- They help in debugging and maintaining code in collaborative projects.
- They allow programmers to temporarily disable specific lines of code during testing without deleting them.

2. Discuss three basic data types in python.

Answer:

Integer (int): Represents whole numbers without a fractional part (e.g., 10, -5). .1

Float (float): Represents real numbers that contain decimal points (e.g., 3.14, -0.5). .2

String (str): Represents sequences of characters enclosed within single or double quotes (e.g., "Hello", 'Python'). .3

3. Describe the difference between integer and float data types in Python.

Answer:

- **Integer (int):** Used to store whole numerical values without decimal points (e.g., x = 20).
- **Float (float):** Used to store numerical values containing a decimal point or fractional component (e.g., x = 20.5). Floats represent real numbers and require dynamic precision handling.

4. How does the if statement differ from the if-else statement?

Answer:

- **if statement:** Executes a block of code only if the given condition evaluates to True. If the condition is False, the block is skipped, and nothing happens.
- **if-else statement:** Provides two execution paths. If the condition is True, the if block executes; if the condition is False, the alternative else block executes.

5. What are logical operators and name all three?

Answer:

Logical operators are used to combine multiple conditional statements or invert Boolean values. The three logical operators in Python are:

and: Returns True only if both operands/conditions are True. .1
or: Returns True if at least one operand/condition is True. .2
not: Reverses the logical state; returns False if the condition is True, and vice-versa. .3

6. How do you get user input in Python?

Answer:

User input in Python is retrieved using the built-in input() function. By default, it takes user input as a string.

Example:

```
name = input("Enter your name: ")
```

7. What is the purpose of print() statement in Python?

Answer:

The print() statement is used to display output, text messages, variable values, or calculation results directly onto the standard output screen (console).

8. What is operator precedence? Give an example.

Answer:

Operator precedence determines the evaluation order of operations in an expression containing multiple operators. Operators with higher precedence are evaluated before operators with lower precedence.

Example:

In result = 5 + 3 * 2, multiplication (*) has higher precedence than addition (+), so 3 * 2 is evaluated first to give 6, and then 5 + 6 results in 11.

9. Write any three main rules for naming variables in Python?

Answer:

Variable names must start with a letter (a–z, A–Z) or an underscore (_), but cannot start with a digit. .1
Variable names can only contain alphanumeric characters and underscores (A-z, 0-9, and _). .2
Variable names are case-sensitive (age, Age, and AGE are three different variables) and cannot be Python keywords (e.g., if, for, class). .3

Long Answer Questions

1. What are the basic data types in Python? Explain integers, floats, strings, and Booleans with examples.

Answer:

Data types define the type of value a variable can store. Python automatically detects the variable data type upon assignment.

Integer (int): .1

Represents positive or negative whole numbers without decimals.

Example:

Python
age = 16
count = -10

2. **Float (`float`):**
   Represents real numbers with fractional parts or decimal points.
   Example:
   ```python
   price = 99.99
   pi = 3.14159

**String (str):** .3

Represents textual data enclosed in single ('), double ("), or triple (""") quotes.
*Example:*
Python
name = "Ali"
greeting = "Hello, World!"

4. **Boolean (`bool`):**
   Represents logical truth values and can only take one of two values: `True` or `False`.
   *Example:*
   ```python
   is_passed = True
   is_logged_in = False

**2. What are arithmetic operators in Python. Provide examples of each operator and explain when you would use them.**

**Answer:**

Arithmetic operators are used to perform mathematical calculations:

**Addition (+):** Adds two numeric values. .1

*Example:* total = 10 + 5 (15)
*Usage:* Calculating total bill or combined scores.

**Subtraction (-):** Subtracts the right operand from the left operand. .2

*Example:* difference = 10 - 5 (5)
*Usage:* Finding remaining balance or age difference.

**Multiplication (*):** Multiplies two numbers. .3

*Example:* product = 4 * 5 (20)
*Usage:* Calculating total cost for multiple items.

**Division (/):** Divides left operand by right operand and returns a float. .4

*Example:* result = 10 / 2 (5.0)
*Usage:* Finding average values.

**Floor Division (//):** Divides left operand by right operand and truncates the decimal part (returns integer). .5

*Example:* result = 10 // 3 (3)

*Usage:* Determining complete whole batches or grouping without fractional parts.

**Modulus (%):** Returns the remainder of division. .6

*Example:* remainder = 10 % 3 (1)

*Usage:* Checking if a number is even or odd (num % 2 == 0).

**Exponentiation (**):** Raises base to the power of exponent. .7

*Example:* power = 2 ** 3 (8)

*Usage:* Calculating compound interest or geometrical areas ($r^2$).

**3. Explain the input() and print() functions with examples.**

**Answer:**

**input() Function:** •

The input() function pauses program execution to accept data entered by the user via the keyboard. It returns all entered input as a **string** (str). If numeric values are required, type casting functions like int() or float() must be used.

*Example:*

Python

age = int(input("Enter your age: "))

* **`print()` Function:**

The `print()` function outputs data, formatted text strings, variables, or expressions to the console window. Multiple arguments can be separated by commas.

*Example:*

```python
name = "Ahmad"
print("Hello", name, "Welcome to Python!")
```

4. Explain how comparison and logical operators work together in conditional statements. Provide a practical example.

Answer:

Comparison operators (e.g., ==, !=, >, <, >=, <=) evaluate relation between values and return a Boolean result (True or False). Logical operators (and, or, not) then combine multiple comparison expressions to form complex conditions in decision-making structures (if-else).

Practical Example:

Checking whether a student qualifies for a scholarship based on GPA and attendance:

Python

gpa = 3.8

attendance = 92

Using comparison operators with logical 'and'

```
if gpa >= 3.5 and attendance >= 90:
    print("Scholarship Granted!")
else:
    print("Not eligible for scholarship.")
```

Explanation: The program compares gpa >= 3.5 (True) and attendance >= 90 (True). The and operator checks both sides; since both are True, the scholarship is granted.

5. Write a program in Python that will take a name from user and display greeting message to the given name.

Answer:

Python

```
# Program to display greeting message
user_name = input("Enter your name: ")
print("Hello " + user_name + "! Welcome to Python Programming.")
```

6. Write a program in python that takes two numbers from user and display their sum.

Answer:

Python

```
# Program to calculate sum of two numbers
num1 = float(input("Enter first number: "))
num2 = float(input("Enter second number: "))

total_sum = num1 + num2
print("The sum of", num1, "and", num2, "is:", total_sum)
```

7. Write a program in python that five numbers from user and display their average.

Answer:

Python

```
# Program to calculate average of five numbers
num1 = float(input("Enter number 1: "))
num2 = float(input("Enter number 2: "))
num3 = float(input("Enter number 3: "))
num4 = float(input("Enter number 4: "))
num5 = float(input("Enter number 5: "))

average = (num1 + num2 + num3 + num4 + num5) / 5
print("The average of the 5 numbers is:", average)
```

8. Solve the following expressions:

a) $8 + 3 * 4 - 22$

Exponentiation (**): $22 = 4$ .1

Expression becomes: $8 + 3 * 4 - 4$ .2

Multiplication (*): $3 * 4 = 12$ .3

Expression becomes: $8 + 12 - 4$ .4

Addition (+): $8 + 12 = 20$ .5
Subtraction (-): $20 - 4 = 16$ .6

Final Result: 16

b) $20\%7 * 3 + 10//3$

Modulus (%) and Floor Division (//) have equal high precedence (left-to-right evaluation): .1

- (remainder of 20 divided by 7)$20\%7 = 6$

Expression becomes: $6 * 3 + 10//3$ .2
Multiplication (*): $6 * 3 = 18$ .3
Expression becomes: $18 + 10//3$ .4
Floor Division (//): $10//3 = 3$ .5
Expression becomes: $18 + 3$ .6
Addition (+): $18 + 3 = 21$ .7

Final Result: 21

c) $2 * 32\%4 + 10 - 6/2$

Exponentiation (**): $32 = 9$ .1
Expression becomes: $2 * 9\%4 + 10 - 6/2$ .2
Multiplication (*), Modulus (%), and Division (/) evaluated left-to-right: .3

- $2 * 9 = 18$

Expression becomes: $18\%4 + 10 - 6/2$ .4

- (remainder of 18 divided by 4)$18\%4 = 2$

Expression becomes: $2 + 10 - 6/2$ .5

- $6/2 = 3.0$

Expression becomes: $2 + 10 - 3.0$ .6
Addition/Subtraction left-to-right: .7

- $2 + 10 = 12$
- $12 - 3.0 = 9.0$

Final Result: 9.0

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