

GUJARAT TECHNOLOGICAL UNIVERSITY

BE-5 SEMESTER – OLD PAPER – S22 TO S25 – QUESTION BANK

Subject Name & Code:

Python Programming- 3151108

Unit 1: Introduction, Data Types and Operators

This unit covers Python basics, variables, data types, and all operators.

Repeated & Important Questions (Focus heavily on these):

1. **Differentiate between List and Tuple.**
 - **Appeared in:** SUM 2023 (07 Marks), WIN 2024 (04 Marks), WIN 2023 (07 Marks), WIN 2022 (03 Marks), SUM 2024 (03 Marks).
 - **Weightage:** Very High. Expect a short or long answer question.
2. **Explain various operators in Python (Arithmetic, Logical, Bitwise, Membership, Identity, etc.).**
 - **Appeared in:** SUM 2023 (07 Marks), WIN 2022 (07 Marks), WIN 2023 (03 Marks), SUM 2025 (07 Marks).
 - **Weightage:** High. Often asked as a full question part.
3. **Explain Dictionary in Python with a suitable example.**
 - **Appeared in:** SUM 2023 (04 Marks), WIN 2022 (03 Marks), SUM 2024 (03 Marks).
 - **Weightage:** High.
4. **What are the key features of Python?**
 - **Appeared in:** SUM 2023 (03 Marks), WIN 2024 (03 Marks - as advantages/disadvantages).
 - **Weightage:** Medium. Likely a short question.
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Other Important Questions from this Unit (Not to be missed):

- **SUM 2023 (03 Marks):** What are keywords in Python?
- **SUM 2023 (03 Marks):** What are local and global variables?
- **SUM 2024 (07 Marks):** Explain various features of a plot in Python. (*Note: Plotting is sometimes included with loops or as a separate topic*)
- **WIN 2023 (07 Marks):** Differentiate List, Tuple, Set, and Dictionary.
- **SUM 2025 (03 Marks):** Explain the difference between = and ==.
- **SUM 2025 (04 Marks):** What is type conversion? Differentiate implicit and explicit.
- **SUM 2025 (07 Marks):** Describe various data types in Python. How does Python manage memory?
- **SUM 2025 (03 Marks):** What are the restrictions on dictionary keys? Can a key be mutable?
- **WIN 2024 (07 Marks):** Demonstrate Membership and Identity operators.

Unit 2: Python Decision making and Loops

This unit covers conditional statements (if, else, elif) and loops (for, while).

Repeated & Important Questions (Focus heavily on these):

1. **Explain break, continue, and pass statements.**
 - **Appeared in:** SUM 2023 (04 Marks), WIN 2022 (04 Marks), SUM 2024 (07 Marks).
 - **Weightage:** Very High.
2. **Explain the for loop and while loop in detail with examples.**
 - **Appeared in:** SUM 2024 (03 Marks for 'for' loop, 03 Marks for 'while' loop), WIN 2022 (03 Marks for both), WIN 2024 (07 Marks for 'while' loop).
 - **Weightage:** High. You must know how to write programs using both.
3. **Write a program to check if a string/number is a palindrome.**
 - **Appeared in:** SUM 2023 (04 Marks), WIN 2024 (04 Marks).
 - **Weightage:** High. A very common programming question.
4. **Write a program to print patterns (pyramid, stars, numbers).**
 - **Appeared in:** SUM 2024 (04 Marks - star pattern), WIN 2022 (07 Marks - pyramid), WIN 2023 (07 Marks - number pattern).
 - **Weightage:** High. Tests understanding of nested loops.

Other Important Questions from this Unit (Not to be missed):

- **SUM 2023 (04 Marks):** Explain nested if-else statement.
- **WIN 2022 (07 Marks):** Explain nested if statements with a program for weather conditions.
- **SUM 2024 (03 Marks):** Explain the structure of a while loop.
- **WIN 2023 (04 Marks):** Write a program to find the sum of first N numbers using a while loop.
- **SUM 2025 (04 Marks):** Explain the difference between if, if...else, and elif.
- **SUM 2025 (03 Marks):** What are the risks of while loops? How to avoid infinite loops?
- **WIN 2024 (03 Marks):** Describe the range() function.

Unit 3: Python Functions and Modules

This unit covers user-defined functions, scopes, modules, and lambda functions.

Repeated & Important Questions (Focus heavily on these):

1. **Write a Python function to sum all numbers/multiply all numbers in a list.**
 - **Appeared in:** SUM 2023 (03 Marks - sum), WIN 2022 (04 Marks - multiply), SUM 2024 (07 Marks - max, min, average).
 - **Weightage:** Very High. A classic function question.
2. **Explain/Differentiate between local and global variables.**
 - **Appeared in:** SUM 2023 (03 Marks), SUM 2025 (07 Marks), WIN 2024 (04 Marks - includes nonlocal).
 - **Weightage:** High.
3. **What is a module? Explain how to import and use modules.**
 - **Appeared in:** SUM 2023 (04 Marks), WIN 2023 (04 Marks), SUM 2025 (04 Marks).
 - **Weightage:** High.
4. **Explain Lambda functions with an example.**
 - **Appeared in:** SUM 2024 (04 Marks), WIN 2023 (04 Marks).
 - **Weightage:** Medium to High.

Other Important Questions from this Unit (Not to be missed):

- **SUM 2023 (07 Marks):** What is type conversion? *(Also fits in Unit 1)*
- **WIN 2022 (07 Marks):** Explain command line arguments.
- **SUM 2024 (04 Marks):** Differentiate actual and formal arguments.
- **SUM 2024 (07 Marks):** Write a program to convert decimal to binary, octal, hexadecimal.
- **SUM 2024 (07 Marks):** Write a program to display the Fibonacci sequence using recursion.
- **WIN 2023 (07 Marks):** Write a program to read a CSV file and find average, max, min marks.
- **SUM 2025 (07 Marks):** Explain the purpose of functions for code reusability with a factorial example.

Unit 4: Python File Operations

This unit covers file I/O, CSV handling, and exception handling.

Repeated & Important Questions (Focus heavily on these):

1. **Explain file handling modes ('r', 'w', 'a', etc.).**
 - **Appeared in:** SUM 2023 (07 Marks), WIN 2022 (04 Marks), WIN 2023 (07 Marks), WIN 2024 (04 Marks), SUM 2025 (04 Marks).
 - **Weightage:** Very High.
2. **Explain exception handling using try and except.**
 - **Appeared in:** SUM 2023 (07 Marks), WIN 2022 (03 Marks - file exceptions), WIN 2023 (04 Marks), SUM 2025 (03 Marks).
 - **Weightage:** Very High.
3. **Write a program to read from/write to a CSV file.**
 - **Appeared in:** SUM 2023 (07 Marks), WIN 2023 (07 Marks), WIN 2024 (04 Marks & 07 Marks).
 - **Weightage:** High. Be prepared to write code for CSV operations.
4. **Write a program to perform operations on a text file (count lines, words, etc.).**
 - **Appeared in:** SUM 2023 (07 Marks - count lines not starting with 'T'), SUM 2024 (04 Marks - read first n lines).
 - **Weightage:** High.

Other Important Questions from this Unit (Not to be missed):

- **WIN 2022 (07 Marks):** Write a program to check password validity.
- **WIN 2022 (07 Marks):** Write a program to find a point's quadrant.
- **WIN 2023 (07 Marks):** Write a program to print Fibonacci numbers to a CSV file.
- **SUM 2025 (04 Marks):** Describe how to read from and write to a text file.

Unit 5: MicroPython

This unit covers the differences from standard Python and programming for microcontrollers.

Repeated & Important Questions (Focus heavily on these):

1. **What is MicroPython? Differentiate between Python and MicroPython.**
 - **Appeared in:** SUM 2023 (04 Marks & 03 Marks), WIN 2022 (03 Marks), WIN 2023 (03 Marks), WIN 2024 (03 Marks), SUM 2025 (07 Marks).
 - **Weightage:** Extremely High. This is almost guaranteed.
2. **Write a MicroPython program to blink an LED.**
 - **Appeared in:** SUM 2024 (04 Marks), WIN 2022 (04 Marks), WIN 2023 (07 Marks), WIN 2024 (07 Marks).
 - **Weightage:** Very High. The most common practical question.
3. **Discuss the merits/demerits/features of MicroPython.**
 - **Appeared in:** WIN 2024 (03 Marks), SUM 2025 (07 Marks), WIN 2023 (07 Marks - merits/demerits).
 - **Weightage:** High.
4. **List IDEs for MicroPython / tools / features of NodeMCU.**
 - **Appeared in:** WIN 2022 (03 Marks), WIN 2024 (04 Marks), SUM 2025 (03 Marks).
 - **Weightage:** Medium. Likely a short answer question.

Other Important Questions from this Unit (Not to be missed):

- **SUM 2023 (04 Marks):** What is MicroPython? Where is it used?
- **WIN 2022 (07 Marks):** Write a program to read sensor data and control an LED.
- **WIN 2024 (07 Marks):** Write a program to read a proximity sensor and blink an LED.
- **WIN 2023 (07 Marks):** Sketch a circuit and write a program to blink LEDs in a ring counter pattern or interface an LCD.
- **SUM 2025 (07 Marks):** Explain the significance of MicroPython in IoT and embedded systems.
