UNIT I: Introduction

Subtopic 5: Loops: For and While

16-Mark Questions:

1. Explain the structure and use of `for` and `while` loops in Python. Provide examples of their use in solving iterative problems in engineering.
2. Discuss the importance of loops in Python programming, with examples of how `for` and `while` loops are used in real-world engineering scenarios.
3. Evaluate the efficiency of `for` and `while` loops in Python for handling large datasets and performing repetitive tasks in engineering applications. Compare their performance with alternative looping constructs.
4. Create a Python program that uses nested loops to generate a specific pattern or solve an engineering-related problem. Explain the logic and expected output of your program.
5. Analyze the role of loops in Python for automating repetitive tasks in engineering applications. Discuss the potential challenges and strategies for optimizing loop performance.