Chapter 1 : Introduction **1-1 to 1-52**

✓ **Syllabus Topic :** The Python Programming Language : History 1-1
1.1 Introduction 1-1
1.1.1 History 1-1
✓ **Syllabus Topic :** Features 1-1
1.1.2 Features of Python Programming 1-1
✓ **Syllabus Topic :** Installing Python 1-4
1.1.3 Installing Python 1-4
✓ **Syllabus Topic :** Running Python Program 1-4
1.1.4 Running a Python Program 1-4
✓ **Syllabus Topic :** Debugging 1-5
1.2 Debugging 1-5
✓ **Syllabus Topic :** Syntax Errors 1-6
1.2.1 Syntax Errors 1-6
✓ **Syllabus Topic :** Runtime Errors 1-6
1.2.2 Runtime Errors 1-6
✓ **Syllabus Topic :** Semantic Errors 1-7
1.2.3 Semantic Errors 1-7
✓ **Syllabus Topic :** Experimental Debugging 1-7
1.2.4 Experimental Debugging 1-7
✓ **Syllabus Topic :** Formal and Natural Languages 1-7
1.3 Formal and Natural Languages 1-7
1.3.1 Difference between Formal and Natural Languages 1-8
✓ **Syllabus Topic :** The Difference between Brackets, Braces and Parentheses 1-9
1.4 The Difference between Brackets, Braces and Parentheses 1-9
✓ **Syllabus Topic :** Values and Types 1-10
1.5 Variables 1-10
1.5.1 Values and Types 1-10
✓ **Syllabus Topic :** Variables 1-11
1.5.2 Variables 1-11
✓ **Syllabus Topic :** Variable Names and Keywords 1-13
1.5.3 Variable Names 1-13
✓ **Syllabus Topic :** Type Conversion 1-13
1.5.4 Type Conversion 1-13
✓ **Syllabus Topic :** Operators and Operands 1-14
1.6 Operators and Operands in Python 1-14
1.6.1 Types of Operators 1-15
✓ **Syllabus Topic :** Expressions 1-23
1.7 Expressions 1-23
1.8 IDLE (Integrated Development Environment) 1-24

✓ **Syllabus Topic :** Interactive Mode 1-24
1.8.1 Interactive Mode 1-24
✓ **Syllabus Topic :** Script Mode 1-26
1.8.2 Script mode 1-26
✓ **Syllabus Topic :** Order of Operations 1-27
1.9 Order of Operations 1-27
1.10 Conditional Statements 1-29
✓ **Syllabus Topic :** Conditional Statement : if 1-30
1.10.1 If Statement 1-30
✓ **Syllabus Topic :** Conditional Statement : if-else 1-31
1.10.2 If….else Statement 1-31
1.10.3 The elif Statement 1-32
✓ **Syllabus Topic :** Conditional Statement: Nested if-else 1-33
1.10.4 Nested if Statement 1-33
1.11 Looping 1-34
✓ **Syllabus Topic :** for Loop 1-35
1.11.1 for Statement 1-35
✓ **Syllabus Topic :** while Loop 1-38
1.11.2 While Statement 1-38
✓ **Syllabus Topic :** Nested Loops 1-43
1.11.3 Nested Loops 1-43
✓ **Syllabus Topic :** Control statements : Terminating Loops, Skipping Specific Conditions 1-44
1.12 Control statements : Terminating loops, skipping specific conditions 1-44
1.12.1 Break statement (Terminating loops) 1-45
1.12.2 Continue statement (skipping specific conditions) 1-47
1.12.3 Pass statement 1-49

Chapter 2 : Functions and Strings **2-1 to 2-30**

2.1 Function 2-1
✓ **Syllabus Topic :** Function calls 2-2
2.2 Function calls 2-2
✓ **Syllabus Topic :** Type Conversion Functions 2-3
2.3 Type Conversion Functions 2-3
✓ **Syllabus Topic :** Math Function 2-4
2.4 Math Function 2-4
✓ **Syllabus Topic :** Composition 2-5
2.5 Composition without return values 2-5
✓ **Syllabus Topic :** Adding New Functions 2-6
2.6 Adding New Functions 2-6
✓ **Syllabus Topic :** Definition and Uses 2-7
2.7 Definition of Function 2-7

✓ **Syllabus Topic :** Flow of Execution 2-7
2.8 Flow of Execution 2-7
✓ **Syllabus Topic :** Parameters and Arguments 2-8
2.9 Parameters and Arguments 2-8
✓ **Syllabus Topic :** Variables and Parameters are Local 2-9
2.10 Variables and Parameters are Local 2-9
✓ **Syllabus Topic :** Stack Diagrams 2-10
2.11 Stack Diagrams 2-10
✓ **Syllabus Topic :** Fruitful Functions and Void Functions 2-11
2.12 Fruitful Functions and Void Functions 2-11
✓ **Syllabus Topic :** Why Functions ? 2-13
2.13 Why Functions ? 2-13
✓ **Syllabus Topic :** Importing with From 2-13
2.14 Importing with from 2-13
✓ **Syllabus Topic :** Return Values 2-14
2.15 Return Values 2-14
✓ **Syllabus Topic :** Incremental Development 2-15
2.15.1 Incremental Development 2-15
✓ **Syllabus Topic :** Composition 2-17
2.15.2 Composition with return values 2-17
✓ **Syllabus Topic :** Boolean Function 2-17
2.16 Boolean Function 2-17
✓ **Syllabus Topic :** More Recursion 2-18
2.17 More Recursion 2-18
✓ **Syllabus Topic :** Leap of Faith 2-20
2.18 Leap of Faith 2-20
✓ **Syllabus Topic :** Checking Types 2-20
2.19 Checking Types 2-20
✓ **Syllabus Topic :** A String is a Sequence 2-21
2.20 String (A String is a Sequence) 2-21
2.20.1 Len Function () 2-23
✓ **Syllabus Topic :** Traversal with a for loop 2-24
2.21 Traversal with a for loop 2-24
✓ **Syllabus Topic :** String slices 2-24
2.22 String Slices 2-24
✓ **Syllabus Topic :** Strings are immutable 2-25
2.23 Strings are Immutable 2-25
✓ **Syllabus Topic :** Searching 2-26
2.24 Searching 2-26
✓ **Syllabus Topic :** Looping and Counting 2-26
2.25 Looping and Counting 2-26

✓ **Syllabus Topic :** String Methods 2-26
2.26 String Methods 2-26
✓ **Syllabus Topic :** The in operator 2-28
2.27 The in Operator 2-28
✓ **Syllabus Topic :** String Comparison 2-28
2.28 String Comparison 2-28

Chapter 3 : Lists, Tuples, Dictionaries and Files **3-1 to 3-60**

3.1 Introduction 3-1
3.2 Lists 3-1
3.2.1 Concept of the Mutable List 3-2
✓ **Syllabus Topic :** Values 3-2
3.2.2 Initializing Values of List 3-2
✓ **Syllabus Topic :** Accessing Elements of List 3-3
3.2.3 Accessing the Elements of List 3-3
✓ **Syllabus Topic :** Traversing a List 3-4
3.2.4 Traversing a List 3-4
✓ **Syllabus Topic :** Deleting Elements from List 3-7
3.2.5 Deleting Elements from List 3-7
✓ **Syllabus Topic :** Built in List Operators 3-7
3.3 Built in List Operators 3-7
3.3.1 '+' operator 3-7
3.3.2 '*' operator 3-8
3.3.3 List slices 3-8
3.4 List Operations 3-9
✓ **Syllabus Topic :** Concatenation 3-9
3.4.1 Concatenation 3-9
✓ **Syllabus Topic :** Repetition 3-10
3.4.2 Repetition 3-10
✓ **Syllabus Topic :** IN operator 3-10
3.4.3 In Operator 3-10
✓ **Syllabus Topic :** Built In List Functions and Methods 3-10
3.5 Built In List Functions and Methods 3-10
✓ **Syllabus Topic :** Tuples 3-17
3.6 Tuples 3-17
3.6.1 Immutable Concept 3-17
✓ **Syllabus Topic :** Accessing the Elements in Tuple 3-19
3.6.2 Accessing the Elements in A Tuple 3-19
✓ **Syllabus Topic :** Tuple Assignment 3-20
3.6.3 Tuple Assignment 3-20
✓ **Syllabus Topic :** Tuples as return values 3-21
3.6.4 Tuples as return values 3-21

✓ **Syllabus Topic :** Variable-length Argument Tuples 3-21
3.6.5 Variable-length argument tuples 3-21
3.7 Basic tuples operations 3-22
✓ **Syllabus Topic :** Concatenation 3-22
3.7.1 Concatenation 3-22
✓ **Syllabus Topic :** Repetition 3-22
3.7.2 Repetition 3-22
✓ **Syllabus Topic :** in Operator 3-23
3.7.3 In Operator 3-23
✓ **Syllabus Topic :** Iteration 3-23
3.7.4 Iteration 3-23
✓ **Syllabus Topic :** Built-in Tuple Functions 3-23
3.8 Tuple Functions 3-23
3.9 Dictionaries 3-26
3.9.1 Concept of Key-Value Pair 3-26
✓ **Syllabus Topic :** Creating a Dictionary 3-27
3.9.2 Creating a Dictionary 3-27
3.9.3 Initializing a Dictionary 3-27
✓ **Syllabus Topic :** Accessing the Values in a Dictionary 3-28
3.9.4 Accessing the Values in a Dictionary 3-28
✓ **Syllabus Topic :** Updating Dictionary 3-28
3.9.5 Updating Elements 3-28
✓ **Syllabus Topic :** Deleting Elements from Dictionary 3-29
3.9.6 Delete Dictionary Elements 3-29
✓ **Syllabus Topic :** Properties of Dictionary Keys 3-29
3.10 Properties of Dictionary Keys 3-29
✓ **Syllabus Topic :** Operations in Dictionary 3-30
3.11 Operations in dictionary 3-30
3.11.1 Traversing Dictionary Element 3-31
3.11.2 Appending Elements in Dictionary 3-31
✓ **Syllabus Topic :** Built-in Dictionary Functions and Methods 3-32
3.12 Dictionary Functions and Methods 3-32
✓ **Syllabus Topic :** Text Files 3-37
3.13 Files-Text Files 3-37
3.13.1 File Input Output 3-37
3.13.2 Opening and Closing Files 3-37
3.13.3 Various Types of File Modes 3-39
✓ **Syllabus Topic :** The File Object Attributes 3-41
3.13.4 Attributes of the File Object 3-41
3.13.5 Reading and Writing to Files 3-42
3.13.6 Renaming and Deleting Files 3-46

✓ **Syllabus Topic :** Directories 3-47
3.13.7 Directories 3-47
✓ **Syllabus Topic :** Exceptions 3-49
3.14 Exceptions 3-49
✓ **Syllabus Topic :** Built-in Exceptions 3-50
3.14.1 Built-in Exceptions 3-50
✓ **Syllabus Topic :** Handling Exceptions 3-53
3.14.2 Handling Exceptions 3-53
✓ **Syllabus Topic :** Exceptions with an Argument 3-57
3.14.3 Exception with an Argument 3-57
✓ **Syllabus Topic :** User Defined Exceptions 3-58
3.14.4 User-Defined Exceptions 3-58

Chapter 4 : Regular Expressions **4-1 to 4-45**

✓ **Syllabus Topic :** Concept of Regular Expressions 4-1
4.1 Concept of Regular Expressions 4-1
✓ **Syllabus Topic :** Various Types of Regular Expression 4-3
4.1.1 Types of Regular Expression 4-3
4.1.2 Regular Expression Patterns 4-3
✓ **Syllabus Topic :** Regular Expression using Match Function 4-7
4.1.3 Regular Expression Methods 4-7
✓ **Syllabus Topic :** Overview of Object Oriented Programming 4-10
4.2 Classes and Objects 4-10
4.2.1 Overview of Object Oriented Programming (OOP) 4-10
✓ **Syllabus Topic :** Class Definition 4-15
4.2.2 Class Definition 4-15
✓ **Syllabus Topic :** Creating Objects 4-16
4.2.3. Creating Objects 4-16
✓ **Syllabus Topic :** Instances as Arguments 4-18
4.2.4 Instances as Arguments 4-18
✓ **Syllabus Topic :** Instances as return values 4-19
4.2.5 Instances as Return Values 4-19
✓ **Syllabus Topic :** Built-In Class Attributes 4-19
4.2.6 Built-In Class Attributes 4-19
✓ **Syllabus Topic :** Inheritance 4-21
4.3 Inheritance 4-21
✓ **Syllabus Topic :** Method overloading 4-23
4.4 Method Overloading 4-23
✓ **Syllabus Topic :** Data Encapsulation 4-24
4.5 Encapsulation 4-24
✓ **Syllabus Topic :** Data Hiding 4-28
4.6 Python Data Hiding 4-28

4.7 Multithreaded Programming 4-29
✓ **Syllabus Topic :** Thread Module 4-30
4.7.1 Thread Module 4-30
✓ **Syllabus Topic :** Create Thread 4-30
4.7.2 Create Thread 4-30
✓ **Syllabus Topic :** Synchronizing Threads 4-34
4.8 Synchronizing Threads 4-34
✓ **Syllabus Topic :** Multithreaded Priority Queue 4-35
4.9 Multithreaded Priority Queue 4-35
4.10 Modules 4-37
✓ **Syllabus Topic :** Importing Module 4-38
4.10.1 Importing Module 4-38
✓ **Syllabus Topic :** Creating and Exploring Modules 4-39
4.10.2 Creating and Exploring Modules 4-39
✓ **Syllabus Topic :** Math Module 4-41
4.10.3 Math Module 4-41
✓ **Syllabus Topic :** Random Module 4-44
4.10.4 Random Module 4-44
✓ **Syllabus Topic :** Time Module 4-45
4.10.5 Time Module 4-45

Chapter 5 : Creating the GUI Form and Adding Widgets **5-1 to 5-53**

5.1 Introduction 5-1
5.2 Widgets 5-2
✓ **Syllabus Topic :** Button 5-2
✓ **Syllabus Topic :** Canvas 5-4
✓ **Syllabus Topic :** Check Button 5-5
✓ **Syllabus Topic :** Entry 5-6
✓ **Syllabus Topic :** Frame 5-7
✓ **Syllabus Topic :** Labels 5-8
✓ **Syllabus Topic :** Listbox 5-9
✓ **Syllabus Topic :** Menubutton 5-10
✓ **Syllabus Topic :** Menu 5-11
✓ **Syllabus Topic :** Message 5-12
✓ **Syllabus Topic :** Radio Button 5-13
✓ **Syllabus Topic :** Scale 5-14
✓ **Syllabus Topic :** Scroll Bars or Sliders 5-14
✓ **Syllabus Topic :** Text 5-15
✓ **Syllabus Topic :** Toplevel Widgets 5-16
✓ **Syllabus Topic :** Spinbox 5-17
✓ **Syllabus Topic :** Paned Window 5-18
✓ **Syllabus Topic :** LabelFrame 5-19

✓ **Syllabus Topic :** tkMessagebox Module 5-20
✓ **Syllabus Topic :** Handling Standard Attributes and Properties of Widgets..... 5-21
5.3 Handling Standard attributes and Properties of Widgets. 5-21
✓ **Syllabus Topic :** Layout Management : Designing GUI Applications with Proper Layout Management Features..... 5-29
5.4 Layout Management : Designing GUI Applications with Proper Layout Management features..... 5-29
✓ **Syllabus Topic :** Enhancing Look and Feel of GUI using Different Appearances of Widgets .. 5-33
5.5 Look and Feel Customization : Enhancing Look and Feel of GUI using Different Appearances of Widgets..... 5-33
✓ **Syllabus Topic :** Connecting to a MySQL Database from Python 5-39
5.6 Storing Data in Our MySQL Database via Our GUI 5-39
5.6.1 Connecting to a MySQL Database from Python 5-39
✓ **Syllabus Topic :** Configuring the MySQL Connection 5-40
5.6.2 Configuring the MySQL Connection 5-40
✓ **Syllabus Topic :** Designing the Python GUI Database..... 5-43
5.6.3 Designing the Python GUI Database..... 5-43
✓ **Syllabus Topic :** Using the INSERT Command..... 5-46
5.6.4 Using the INSERT Command 5-46
✓ **Syllabus Topic :** Using the UPDATE Command 5-48
5.6.5 Using the UPDATE Command 5-48
✓ **Syllabus Topic :** Using the DELETE Command..... 5-49
5.6.6 Using the DELETE Command..... 5-49
✓ **Syllabus Topic :** Storing and Retrieving Data from MySQL Database..... 5-50
5.6.7 Storing and Retrieving Data from MySQL Database..... 5-50

- **Model Question Papers ..... M-1 to M-04**
- **List of Practicals ..... P-1 to P-28**
- **Appendix A : Solved University Question Paper of Oct. 2017..... A-1 to A-40**
- **Appendix B : Solved University Question Paper of April 2018 & Nov. 2018 .....B-1 to B-36**
- **Question Papers : April 2018 and Nov. 2018 .....Q-1 to Q-08**

❑❑❑