



<b>Chapter 1 : Introduction</b>	<b>1-1 to 1-52</b>
✓ <b>Syllabus Topic : The Python Programming Language : History</b> .....	1-1
1.1 Introduction .....	1-1
1.1.1 History .....	1-1
✓ <b>Syllabus Topic : Features</b> .....	1-1
1.1.2 Features of Python Programming .....	1-1
✓ <b>Syllabus Topic : Installing Python</b> .....	1-4
1.1.3 Installing Python.....	1-4
✓ <b>Syllabus Topic : Running Python Program</b> .....	1-4
1.1.4 Running a Python Program.....	1-4
✓ <b>Syllabus Topic : Debugging</b> .....	1-5
1.2 Debugging .....	1-5
✓ <b>Syllabus Topic : Syntax Errors</b> .....	1-6
1.2.1 Syntax Errors .....	1-6
✓ <b>Syllabus Topic : Runtime Errors</b> .....	1-6
1.2.2 Runtime Errors.....	1-6
✓ <b>Syllabus Topic : Semantic Errors</b> .....	1-7
1.2.3 Semantic Errors.....	1-7
✓ <b>Syllabus Topic : Experimental Debugging</b> .....	1-7
1.2.4 Experimental Debugging .....	1-7
✓ <b>Syllabus Topic : Formal and Natural Languages</b> .....	1-7
1.3 Formal and Natural Languages .....	1-7
1.3.1 Difference between Formal and Natural Languages .....	1-8
✓ <b>Syllabus Topic : The Difference between Brackets, Braces and Parentheses</b> .....	1-9
1.4 The Difference between Brackets, Braces and Parentheses.....	1-9
✓ <b>Syllabus Topic : Values and Types</b> .....	1-10
1.5 Variables.....	1-10
1.5.1 Values and Types.....	1-10
✓ <b>Syllabus Topic : Variables</b> .....	1-11
1.5.2 Variables .....	1-11
✓ <b>Syllabus Topic : Variable Names and Keywords</b> .....	1-13
1.5.3 Variable Names.....	1-13
✓ <b>Syllabus Topic : Type Conversion</b> .....	1-13
1.5.4 Type Conversion.....	1-13
✓ <b>Syllabus Topic : Operators and Operands</b> .....	1-14
1.6 Operators and Operands in Python .....	1-14
1.6.1 Types of Operators.....	1-15
✓ <b>Syllabus Topic : Expressions</b> .....	1-23
1.7 Expressions.....	1-23
1.8 IDLE (Integrated Development Environment) .....	1-24



---

✓	<b>Syllabus Topic : Interactive Mode</b> .....	1-24
	1.8.1    Interactive Mode .....	1-24
✓	<b>Syllabus Topic : Script Mode</b> .....	1-26
	1.8.2    Script mode .....	1-26
✓	<b>Syllabus Topic : Order of Operations</b> .....	1-27
1.9	Order of Operations.....	1-27
1.10	Conditional Statements .....	1-29
✓	<b>Syllabus Topic : Conditional Statement : if</b> .....	1-30
	1.10.1  If Statement .....	1-30
✓	<b>Syllabus Topic : Conditional Statement : if-else</b> .....	1-31
	1.10.2  If.....else Statement.....	1-31
	1.10.3  The elif Statement .....	1-32
✓	<b>Syllabus Topic : Conditional Statement: Nested if-else</b> .....	1-33
	1.10.4  Nested if Statement .....	1-33
1.11	Looping .....	1-34
✓	<b>Syllabus Topic : for Loop</b> .....	1-35
	1.11.1  for Statement.....	1-35
✓	<b>Syllabus Topic : while Loop</b> .....	1-38
	1.11.2  While Statement.....	1-38
✓	<b>Syllabus Topic : Nested Loops</b> .....	1-43
	1.11.3  Nested Loops .....	1-43
✓	<b>Syllabus Topic : Control statements : Terminating Loops, Skipping Specific Conditions</b> .....	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
✓	<b>Syllabus Topic : Function calls</b> .....	2-2
2.2	Function calls .....	2-2
✓	<b>Syllabus Topic : Type Conversion Functions</b> .....	2-3
2.3	Type Conversion Functions .....	2-3
✓	<b>Syllabus Topic : Math Function</b> .....	2-4
2.4	Math Function .....	2-4
✓	<b>Syllabus Topic : Composition</b> .....	2-5
2.5	Composition without return values .....	2-5
✓	<b>Syllabus Topic : Adding New Functions</b> .....	2-6
2.6	Adding New Functions .....	2-6
✓	<b>Syllabus Topic : Definition and Uses</b> .....	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
<b>Chapter 3 : Lists, Tuples, Dictionaries and Files</b>	<b>3-1 to 3-60</b>
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



---

✓	<b>Syllabus Topic : Variable-length Argument Tuples</b> .....	3-21
	3.6.5 Variable-length argument tuples.....	3-21
3.7	Basic tuples operations.....	3-22
✓	<b>Syllabus Topic : Concatenation</b> .....	3-22
	3.7.1 Concatenation .....	3-22
✓	<b>Syllabus Topic : Repetition</b> .....	3-22
	3.7.2 Repetition.....	3-22
✓	<b>Syllabus Topic : in Operator</b> .....	3-23
	3.7.3 In Operator .....	3-23
✓	<b>Syllabus Topic : Iteration</b> .....	3-23
	3.7.4 Iteration .....	3-23
✓	<b>Syllabus Topic : Built-in Tuple Functions</b> .....	3-23
3.8	Tuple Functions.....	3-23
3.9	Dictionaries .....	3-26
	3.9.1 Concept of Key-Value Pair.....	3-26
✓	<b>Syllabus Topic : Creating a Dictionary</b> .....	3-27
3.9.2	Creating a Dictionary .....	3-27
	3.9.3 Initializing a Dictionary .....	3-27
✓	<b>Syllabus Topic : Accessing the Values in a Dictionary</b> .....	3-28
	3.9.4 Accessing the Values in a Dictionary .....	3-28
✓	<b>Syllabus Topic : Updating Dictionary</b> .....	3-28
	3.9.5 Updating Elements.....	3-28
✓	<b>Syllabus Topic : Deleting Elements from Dictionary</b> .....	3-29
	3.9.6 Delete Dictionary Elements .....	3-29
✓	<b>Syllabus Topic : Properties of Dictionary Keys</b> .....	3-29
3.10	Properties of Dictionary Keys .....	3-29
✓	<b>Syllabus Topic : Operations in Dictionary</b> .....	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
✓	<b>Syllabus Topic : Built-in Dictionary Functions and Methods</b> .....	3-32
3.12	Dictionary Functions and Methods .....	3-32
✓	<b>Syllabus Topic : Text Files</b> .....	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
✓	<b>Syllabus Topic : The File Object Attributes</b> .....	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



---

✓	<b>Syllabus Topic : Directories</b> .....	3-47
	3.13.7 Directories.....	3-47
✓	<b>Syllabus Topic : Exceptions</b> .....	3-49
3.14	Exceptions .....	3-49
✓	<b>Syllabus Topic : Built-in Exceptions</b> .....	3-50
	3.14.1 Built-in Exceptions.....	3-50
✓	<b>Syllabus Topic : Handling Exceptions</b> .....	3-53
	3.14.2 Handling Exceptions.....	3-53
✓	<b>Syllabus Topic : Exceptions with an Argument</b> .....	3-57
	3.14.3 Exception with an Argument.....	3-57
✓	<b>Syllabus Topic : User Defined Exceptions</b> .....	3-58
	3.14.4 User-Defined Exceptions.....	3-58
<b>Chapter 4 : Regular Expressions</b>		<b>4-1 to 4-45</b>
✓	<b>Syllabus Topic : Concept of Regular Expressions</b> .....	4-1
4.1	Concept of Regular Expressions .....	4-1
✓	<b>Syllabus Topic : Various Types of Regular Expression</b> .....	4-3
	4.1.1 Types of Regular Expression.....	4-3
	4.1.2 Regular Expression Patterns .....	4-3
✓	<b>Syllabus Topic : Regular Expression using Match Function</b> .....	4-7
	4.1.3 Regular Expression Methods.....	4-7
✓	<b>Syllabus Topic : Overview of Object Oriented Programming</b> .....	4-10
4.2	Classes and Objects.....	4-10
	4.2.1 Overview of Object Oriented Programming (OOP).....	4-10
✓	<b>Syllabus Topic : Class Definition</b> .....	4-15
	4.2.2 Class Definition .....	4-15
✓	<b>Syllabus Topic : Creating Objects</b> .....	4-16
	4.2.3. Creating Objects.....	4-16
✓	<b>Syllabus Topic : Instances as Arguments</b> .....	4-18
	4.2.4 Instances as Arguments .....	4-18
✓	<b>Syllabus Topic : Instances as return values</b> .....	4-19
	4.2.5 Instances as Return Values .....	4-19
✓	<b>Syllabus Topic : Built-In Class Attributes</b> .....	4-19
	4.2.6 Built-In Class Attributes .....	4-19
✓	<b>Syllabus Topic : Inheritance</b> .....	4-21
4.3	Inheritance.....	4-21
✓	<b>Syllabus Topic : Method overloading</b> .....	4-23
4.4	Method Overloading .....	4-23
✓	<b>Syllabus Topic : Data Encapsulation</b> .....	4-24
4.5	Encapsulation .....	4-24
✓	<b>Syllabus Topic : Data Hiding</b> .....	4-28
4.6	Python Data Hiding.....	4-28



4.7	Multithreaded Programming .....	4-29
✓	<b>Syllabus Topic : Thread Module</b> .....	4-30
	4.7.1 Thread Module.....	4-30
✓	<b>Syllabus Topic : Create Thread</b> .....	4-30
	4.7.2 Create Thread.....	4-30
✓	<b>Syllabus Topic : Synchronizing Threads</b> .....	4-34
4.8	Synchronizing Threads.....	4-34
✓	<b>Syllabus Topic : Multithreaded Priority Queue</b> .....	4-35
4.9	Multithreaded Priority Queue .....	4-35
4.10	Modules.....	4-37
✓	<b>Syllabus Topic : Importing Module</b> .....	4-38
	4.10.1 Importing Module .....	4-38
✓	<b>Syllabus Topic : Creating and Exploring Modules</b> .....	4-39
	4.10.2 Creating and Exploring Modules.....	4-39
✓	<b>Syllabus Topic : Math Module</b> .....	4-41
	4.10.3 Math Module.....	4-41
✓	<b>Syllabus Topic : Random Module</b> .....	4-44
	4.10.4 Random Module .....	4-44
✓	<b>Syllabus Topic : Time Module</b> .....	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
✓	<b>Syllabus Topic : Button</b> .....	5-2
✓	<b>Syllabus Topic : Canvas</b> .....	5-4
✓	<b>Syllabus Topic : Check Button</b> .....	5-5
✓	<b>Syllabus Topic : Entry</b> .....	5-6
✓	<b>Syllabus Topic : Frame</b> .....	5-7
✓	<b>Syllabus Topic : Labels</b> .....	5-8
✓	<b>Syllabus Topic : Listbox</b> .....	5-9
✓	<b>Syllabus Topic : Menubutton</b> .....	5-10
✓	<b>Syllabus Topic : Menu</b> .....	5-11
✓	<b>Syllabus Topic : Message</b> .....	5-12
✓	<b>Syllabus Topic : Radio Button</b> .....	5-13
✓	<b>Syllabus Topic : Scale</b> .....	5-14
✓	<b>Syllabus Topic : Scroll Bars or Sliders</b> .....	5-14
✓	<b>Syllabus Topic : Text</b> .....	5-15
✓	<b>Syllabus Topic : Toplevel Widgets</b> .....	5-16
✓	<b>Syllabus Topic : Spinbox</b> .....	5-17
✓	<b>Syllabus Topic : Paned Window</b> .....	5-18
✓	<b>Syllabus Topic : LabelFrame</b> .....	5-19



✓	<b>Syllabus Topic : tkMessageBox Module .....</b>	<b>5-20</b>
✓	<b>Syllabus Topic : Handling Standard Attributes and Properties of Widgets.....</b>	<b>5-21</b>
5.3	Handling Standard attributes and Properties of Widgets. ....	5-21
✓	<b>Syllabus Topic : Layout Management : Designing GUI Applications with Proper Layout Management Features.....</b>	<b>5-29</b>
5.4	Layout Management : Designing GUI Applications with Proper Layout Management features.....	5-29
✓	<b>Syllabus Topic : Enhancing Look and Feel of GUI using Different Appearances of Widgets ..</b>	<b>5-33</b>
5.5	Look and Feel Customization : Enhancing Look and Feel of GUI using Different Appearances of Widgets .....	5-33
✓	<b>Syllabus Topic : Connecting to a MySQL Database from Python .....</b>	<b>5-39</b>
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
✓	<b>Syllabus Topic : Configuring the MySQL Connection .....</b>	<b>5-40</b>
	5.6.2 Configuring the MySQL Connection .....	5-40
✓	<b>Syllabus Topic : Designing the Python GUI Database.....</b>	<b>5-43</b>
	5.6.3 Designing the Python GUI Database .....	5-43
✓	<b>Syllabus Topic : Using the INSERT Command.....</b>	<b>5-46</b>
	5.6.4 Using the INSERT Command .....	5-46
✓	<b>Syllabus Topic : Using the UPDATE Command .....</b>	<b>5-48</b>
	5.6.5 Using the UPDATE Command .....	5-48
✓	<b>Syllabus Topic : Using the DELETE Command.....</b>	<b>5-49</b>
	5.6.6 Using the DELETE Command .....	5-49
✓	<b>Syllabus Topic : Storing and Retrieving Data from MySQL Database.....</b>	<b>5-50</b>
	5.6.7 Storing and Retrieving Data from MySQL Database .....	5-50
	• <b>Model Question Papers .....</b>	<b>M-1 to M-04</b>
	• <b>List of Practicals .....</b>	<b>P-1 to P-28</b>
	• <b>Appendix A : Solved University Question Paper of Oct. 2017.....</b>	<b>A-1 to A-40</b>
	• <b>Appendix B : Solved University Question Paper of April 2018 &amp; Nov. 2018 .....</b>	<b>B-1 to B-36</b>
	• <b>Question Papers : April 2018 and Nov. 2018 .....</b>	<b>Q-1 to Q-08</b>