

# Table of Contents

---

Introduction .....	vii
--------------------	-----

## Chapter 1: Fundamental Concepts of OOP..... 1

1.1	Overview of Programming .....	1
	Steps for Solving Problem.....	2
	Techniques of Solving Problem.....	2
	Structured Programming .....	7
	Object- Oriented Programming.....	7
1.2	Principles of OOP .....	8
	Objects .....	8
	Classes.....	8
	Data Hiding and Encapsulation .....	9
	Data Abstraction.....	9
	Inheritance.....	9
	Polymorphism.....	10
	Dynamic Data Binding .....	11
	Message Communication.....	11
1.3	Exception Handling.....	11
	Exception Hierarchy .....	12
	Types of Exceptions .....	14
1.4	Differences and Similarities between C++ and Java .....	15
	Summary.....	16
	Exercises.....	16
	True or False .....	17
	Multiple Choice Questions .....	17
	Short Answer Questions .....	18

## Chapter 2: Fundamental Concepts of Programming .....21

2.1	Introducing Java.....	21
	Types of Java Programs .....	22
	Features of Java.....	23
2.2	Introducing the Java Environment.....	25
	Explaining JDK.....	25
	Explaining Java Platform Components.....	26
2.3	Structure of Java Program.....	28
2.4	Basic Programming Elements in Java .....	28
	Keywords .....	28
	Data Types .....	31
	Variables.....	34

---

	Operators.....	38
	Expressions.....	53
2.5	Control Statements in Java.....	53
	Using Selection Statements.....	54
	Using Iteration Statements.....	60
	Using Jump Statements.....	67
2.6	Type Casting.....	71
	Automatic Type Casting.....	71
	Casting Incompatible Data Types.....	72
2.7	Input Output using Scanner Class.....	73
	Summary.....	74
	Exercises.....	75
	True or False.....	75
	Multiple Choice Questions.....	75
	Short Answer Questions.....	77
	Programs.....	79
<b>Chapter 3: Classes and Objects.....</b>		<b>83</b>
3.1	Declaring Classes.....	83
3.2	Creating Objects.....	86
3.3	Working with Methods in a Class.....	88
	Declaring Methods.....	89
	Passing Parameters to Methods.....	90
	Returning Parameters from Methods.....	92
	Method Overloading.....	93
3.4	Constructor and finalize() method.....	96
	Defining Simple Constructors.....	97
	Defining Parameterized Constructors.....	98
	Overloading Constructors.....	99
	The finalize() Method.....	101
3.5	Arrays.....	101
	Using One-Dimensional Array.....	102
	Using Multi-Dimensional Array.....	105
	Using Array of Objects.....	110
	Using the System.arraycopy() Method.....	112
	Summary.....	113
	Exercises.....	114
	True or False.....	114
	Multiple Choice Questions.....	114
	Short Answer Questions.....	116
	Programs.....	119

---

<b>Chapter 4: Inheritance, Interface, and Package .....</b>	<b>125</b>
4.1 Introducing the Access Modifiers in Java.....	126
4.2 Understanding Inheritance in Java.....	127
Types of Inheritance.....	129
4.3 Using the super Keyword .....	135
4.4 Methods Overriding.....	136
4.5 Declaring Abstract Classes.....	138
4.6 Using the final Keyword.....	139
4.7 Interfaces .....	141
Declaring Interfaces .....	141
Implementing Interfaces.....	142
4.8 Packages.....	144
Defining Package.....	144
Setting up the CLASSPATH.....	147
Importing Package .....	148
Summary.....	149
Exercises.....	150
True or False .....	150
Multiple Choice Questions .....	150
Short Answer Questions .....	152
Programs .....	154
<b>Chapter 5: Multithreading .....</b>	<b>161</b>
5.1 Defining Threads.....	161
Describing the Main Thread .....	162
5.2 Instantiating a Thread.....	164
5.3 Starting Threads.....	166
5.4 Starting and Running Multiple Threads .....	167
5.5 Life Cycle of Thread.....	169
The New State .....	169
The Runnable State .....	169
The Running State .....	169
The Waiting (blocking/sleeping) State.....	169
The Dead State .....	170
5.6 Thread Priorities.....	170
5.7 Exploring the Thread Mechanisms.....	172
Thread Scheduler.....	172
Running and Yielding.....	172
Sleeping and Waking Up Threads.....	173
The join() Method.....	175
Blocking for I/O.....	177
Thread Termination.....	177

---

	Deadlock .....	178
5.8	Implementing the Thread Synchronization Mechanism.....	178
	Synchronized Methods .....	179
	Synchronized Blocks.....	182
5.9	Implementing Thread Interaction .....	183
	Summary.....	187
	Exercises.....	187
	True or False .....	187
	Multiple Choice Questions .....	188
	Short Answer Questions .....	189
	Programs .....	191
<b>Chapter 6: Applet.....</b>		<b>199</b>
6.1	Overview of Applets .....	200
	Life Cycle of an Applet.....	200
	Comparing Applets and Applications .....	201
6.2	Creating Applets .....	202
	Using the HTML Applet Tag .....	206
	Initializing and Terminating an Applet .....	208
	Using the paint() Method .....	209
	Using the update() Method .....	209
	Invoking the repaint() Method .....	210
	Implementing Multithreading with Applets.....	211
	Passing Parameters to Applets .....	213
6.3	Working with the Graphics Class .....	214
	Drawing Lines .....	218
	Drawing Rectangles .....	219
	Drawing Ovals.....	220
	Drawing Arcs.....	222
	Drawing Polygon .....	223
6.4	Working with the Color Class.....	224
6.5	Working with the Font Class.....	228
	Determining the Available Fonts.....	233
	Creating and Selecting Fonts .....	234
	Using the FontMetrics Class.....	236
	Summary.....	239
	Exercises.....	239
	True False.....	240
	Multiple Choice Questions .....	240
	Short Answer Questions .....	241
	Programs .....	245

<b>Index .....</b>	<b>253</b>
<b>Online Resource available with the Book .....</b>	<b>256</b>