

TABLE OF CONTENTS

Chapter 1: Declaration, Initialization, and Access Control	1
Identifiers (Objective 1.3).....	3
Legal Identifiers.....	3
Keywords.....	4
Naming Conventions (Objective 1.3)	6
Naming Conventions for Classes and Interfaces	6
Naming Conventions for Methods	7
Naming Conventions for Variables	7
Naming Conventions for Constants	7
Naming Conventions for JavaBeans	8
White Spaces.....	9
Blank Lines	10
Blank Spaces.....	10
Comments.....	11
Declaring and Using Packages (Objective 1.1).....	12
Declaring Java Packages	12
Using Packages	14
Inline Member Declarations	14
Importing Single Package Member	14
Importing Entire Package	15
Defining and Instantiating Classes (Objective 1.1, 1.2, and 1.6)	16
Declaring Classes.....	17
Declaring the Final Classes.....	17
Declaring the Abstract Classes	18
Declaring the Nested Classes	20
Instantiating Classes (Objective 1.6).....	23
Instantiating the Non-Nested Classes	23
Instantiating the Nested Classes	24
Defining Interfaces (Objective 1.1 and 1.2)	27
Declaring Interfaces	28
Implementing Interfaces.....	29
Declaring Class Members (Objective 1.3 and 1.4).....	31
Declaring Methods Using Access Modifiers.....	31
The public Method.....	32

The private Method	34
The protected and default Methods	35
Declaring Methods Using the Non-access Modifiers	36
The final Methods and Arguments.....	37
The abstract Methods	38
Synchronized Methods.....	39
Native Methods.....	40
Methods with var-args	40
Declaring Variables	41
Declaring Primitive Variables	42
Declaring Reference Variables	43
Declaring Instance Variables.....	43
Declaring Local Variables	44
Declaring Final Variables.....	46
Declaring Transient Variables	46
Declaring Volatile Variables.....	47
Declaring Static Variables	47
Declaring Enums	48
Declaring Arrays	49
One-Dimensional Array.....	49
Using a Two-Dimensional Array.....	51
Points to Remember.....	54
Try It	57
Chapter 2: Object-Oriented Programming Principles.....	61
Implementing Encapsulation (Objective 5.1)	63
Inheritance, Is-A and Has-A Relationships (Objective 5.5)	66
Implementing the IS-A and HAS-A Relationships	69
The IS-A Relationship.....	69
The HAS-A Relationship.....	70
Implementing Polymorphism (Objective 5.2).....	71
Static Polymorphism.....	71
Dynamic Polymorphism.....	73
Implementing Overriding and Overloading (Objectives 1.5 and 5.4).....	74
Method Overriding	74
Calling the Superclass Version of an Overridden Method.....	76
Method Overloading.....	76

Declaring and Invoking Overloaded Methods	77
Comparing Overloading and Overriding	79
Reference Variable Casting (Objective 5.2).....	81
Legal Return Types (Objective 1.5).....	84
Declaring Return Types.....	84
Declaring Return Type on Overloaded Methods.....	85
Declaring Return Types of Overridden Methods and Covariant Returns.....	87
Constructors Declaration (Objective 1.6)	88
Declaring and Invoking the Default Constructors.....	89
Declaring and Invoking Constructors with Arguments.....	90
Invoking Constructors of Superclasses and Subclasses	91
Constructor Overloading	92
Static Variables and Methods (Objective 1.3).....	93
Implementing Coupling and Cohesion (Objective 5.1).....	98
Points to Remember.....	100
Try It	102
Chapter 3: Assignments	109
Literals, Assignments, and Variables (Objective 1.3 and 7.6).....	110
Literal Values for All Primitive Types	111
Integer Literals.....	111
Decimal Literals	111
Octal Literals.....	112
Hexadecimal Literals.....	112
Floating-Point Literals.....	113
Boolean Literals.....	115
Character Literals.....	116
Assigning Values to Variables	117
Primitive Assignment.....	118
Reference Variable Assignment	123
Variable Scope.....	126
Using an Uninitialized Variable or Array Element.....	128
Instance Variables	128
Local Primitives and Objects	132
Assigning Reference Variables	135
Passing Variables as Method Parameters (Objective 7.3)	138
Passing Object Reference Variables in Methods.....	138

Passing Primitive Variables in Methods.....	139
Points to Remember.....	142
Try It.....	144
Chapter 4: Operators.....	151
Operators in Java (Objective 7.6).....	152
Arithmetic Operators.....	153
Concatenation Operator.....	157
Assignment Operators.....	159
Relational Operators.....	162
Primitive Equality.....	164
Object Equality.....	164
Enumeration Equality.....	167
The instanceof Operator.....	169
Logical Operators.....	173
Conditional Operator.....	178
Points to Remember.....	182
Try It.....	183
Chapter 5: Flow Controls, Assertions, and Exceptions.....	189
Implementing if and switch Statements (Objective 2.1).....	191
Using the if Statement.....	191
Using the if...else Statement.....	193
Using the switch...case Statement.....	197
Implementing Loops and Iterators (Objective 2.2).....	204
Implementing the while Loop.....	204
Implementing the do...while Loop.....	206
Implementing the for Loop.....	207
Implementing the Nested for Loop.....	211
Implementing the for...each Loop.....	212
Implementing Jump Statements (Objective 2.2).....	214
Implementing the break Statement.....	214
Implementing the continue Statement.....	216
Implementing the return Statement.....	218
Assertions (Objective 2.3).....	219
Exploring Assertions.....	220
Using Assertions.....	222

Exception Handling (Objectives 2.4, 2.5, and 2.6).....	224
Errors and Exceptions in a Java Program.....	226
Handling Exceptions.....	229
Using the try-catch Blocks	229
Using the finally Block	233
Using the throws Clause.....	234
Using the throw Clause	236
Re-throwing an Exception.....	237
Common Errors and Exceptions (Objective 2.6).....	238
Points to Remember.....	241
Try It	243
Chapter 6: Wrappers, Strings, and Formatters.....	293
Wrapper Classes (Objective 3.1).....	251
Overview of the Wrapper classes.....	251
Creating the Wrapper objects	252
Constructors of Wrapper Classes	252
Methods of Wrapper Classes.....	253
Autoboxing.....	262
Unboxing	263
String, StringBuilder, and StringBuffer Classes (Objective 3.1).....	265
The String Class	265
Methods of the String Class	269
The valueOf () Method	270
The toString() Method	270
The substring() Method.....	270
The trim() Method.....	271
The concat() Method.....	271
The replace() Method	272
The toUpperCase() and toLowerCase() Methods.....	273
The equalsIgnoreCase() Method	273
The length() Method	273
The charAt() Method	274
The StringBuffer and StringBuilder Classes	274
Methods of the StringBuffer Class	275
The append(String s) Method	276
The reverse() Method	276

The toString() Method	276
The insert() Method	276
The delete() Method	276
Methods of the StringBuilder Class	277
The delete(int start, int end) Method.....	277
The insert(int offset, String s) Method.....	277
Difference Between the String, StringBuilder and StringBuffer Classes	278
Working with Dates, Numbers, and Currencies (Objective 3.4).....	280
Using the java.util.Date Class	280
Using the java.util.Calendar Class	282
Using the java.util.Locale Class	285
Using the java.text.DateFormat Class.....	288
Using the java.text.NumberFormat Class	292
Searching, Tokenizing, and Formatting (Objective 3.5).....	295
Searching with Matcher and Pattern Classes.....	296
Simple Searching.....	297
Searching with Metacharacters	299
Searching with Quantifiers	302
Searching with Predefined Dot	304
Searching with Greedy Quantifiers	304
Searching with the Scanner Class	306
Tokenizing.....	307
Tokens and Delimiters	307
Using the String.split() Method.....	307
Using the Scanner Class	308
Formatting.....	311
The format() Method	311
The printf() Method	314
Points to Remember.....	317
Try It	321
Chapter 7: Collections and Generics	329
Overriding Methods of the Object Class (Objective 6.2).....	331
The toString() Method	332
The equals() Method	333
The equals() Contract	334
Need of Overriding the equals() Method	334

Overriding the equals() Method	335
The hashCode() Method	337
The hashCode() Contract	337
Overriding the hashCode() Method	338
Collections (Objective 6.1).....	340
The Collection API	340
The Set Interface.....	343
The Map Interface	343
The Queue Interface	345
Implementing the Collections Framework (Objective 6.3 and 6.5)	346
Using the List Interface.....	347
Sorting Collections and Arrays.....	348
Sorting Collections.....	348
Using the Comparable Interface	350
Using the Comparator Interface.....	351
Sorting Arrays	353
Searching Collections and Arrays	354
Searching Collections	354
Searching Arrays.....	355
Converting Lists into Arrays and Vice Versa	356
Converting a List into an Array	356
Converting an Array into a List	357
Using Maps	357
Navigating TreeSet and TreeMap.....	358
Using the Set Interface	365
Using the PriorityQueue class	366
Generic Type (Objectives 6.3 and 6.4)	368
Generic Classes and Non-Generic Classes in a Collection.....	370
Generic Methods	374
Generic Declarations	378
Creating Your Own Generic Class.....	378
Creating Generic Methods.....	381
Points to Remember.....	384
Try It	386

Chapter 8: I/O Operations	395
Navigating File Systems and Performing I/O Operations (Objective 3.2).....	396
Using the File Class	397
Using the FileWriter Class.....	403
Using the FileReader Class.....	405
Using the BufferedWriter Class.....	408
Using the BufferedReader Class.....	408
Using the PrintWriter Class	409
Using the Console Class	411
Serialization (Objective 3.3)	414
The Serializable Interface	414
Understanding Streams	415
The FileOutputStream and FileInputStream Classes.....	416
The DataOutputStream and DataInputStream Classes.....	417
The ObjectOutputStream and ObjectInputStream Classes	419
Serializing and Deserializing Objects	419
Serialization and Inheritance	423
Serializing and Deserializing the References to Objects.....	425
Points to Remember.....	435
Try It	438
Chapter 9: Threads and Locks.....	445
Defining, Instantiating, and Starting Threads (Objective 4.1).....	447
Overview of Threads	447
The Main Thread.....	447
Defining Threads.....	448
Extending the java.lang.Thread Class	448
Implementing the java.lang.Runnable Interface	449
Instantiating Threads	450
Starting Threads	451
Starting and Running Multiple Threads.....	454
Thread States and Transitions (Objective 4.2).....	456
Thread States.....	456
Identifying Thread States.....	456
Thread Priorities	457
Thread Scheduler.....	459
Running and Yielding Threads	459

Sleeping and Waking up of Threads.....	460
Joining.....	462
Blocking for I/O Operations.....	464
Thread Termination.....	464
Deadlocks.....	465
Code Synchronization (Objective 4.3).....	466
Locks.....	467
Synchronized Methods.....	467
Synchronized Blocks of Codes.....	470
Thread Interaction (Objective 4.4).....	471
Points to Remember.....	477
Try It.....	479
Chapter 10: Development.....	487
Declaring and Using Classpaths (Objective 7.5).....	488
Working with Java and Javac Commands (Objectives 7.1, 7.2, and 7.5).....	490
Compiling Java Files Using the javac Command.....	490
Executing Class Files Using the java Command.....	492
The JAR Utility (Objective 7.5).....	493
Navigating a JAR File.....	494
Garbage Collection (Objective 7.4).....	496
The Object.finalize() Method.....	497
Recognizing Objects Explicitly for Garbage Collection.....	498
Implementing Static Imports (Objective 7.1).....	499
Points to Remember.....	502
Try It.....	503
Solutions (Try It).....	509
Index.....	533