

# Contents

<i>Introduction</i>	<i>xvii</i>
<i>Assessment Test</i>	<i>xxx</i>
<b>Chapter 1</b>	<b>Oracle Database 10g Components and Architecture 1</b>
The Oracle Product Family	2
Oracle 10g	3
Oracle Application Server 10g	4
Oracle Developer Suite	4
Oracle Applications 11i	5
Oracle Collaboration Suite	5
Oracle Services	5
Relational Database Concepts	6
Rows, Columns, Tables, and Databases	7
Relationships and Constraints	11
Other Segment Types	17
Interacting with Segments	19
The Oracle Architecture	25
User Processes	26
The Oracle Instance	28
The Oracle Database	38
Installing Oracle 10g	48
Review the Documentation	48
Review the System Requirements	48
Plan Your Install	49
Using the Oracle Universal Installer	56
Summary	65
Exam Essentials	66
Review Questions	68
Answers to Review Questions	72
<b>Chapter 2</b>	<b>Creating and Controlling a Database 75</b>
The Oracle Enterprise Management Framework	76
Starting and Stopping the Oracle Management Agent	78
Accessing a Database Using the Database Control	80
Using <i>iSQL*Plus</i>	80
Using the Oracle Database Configuration Assistant	84
Creating an Oracle Database Using the DBCA	84
Configuring an Oracle Database Using DBCA	106
Deleting an Oracle Database Using DBCA	106
Managing Database Templates Using DBCA	107
Managing Parameter Initialization Files	109

**xii Contents**

	Starting Up and Shutting Down an Oracle Database	111
	Oracle 10g Database Startup	111
	Shutting Down an Oracle 10g Database	117
	Shutting Down Oracle Using EM Database Control	118
	Shutting Down Oracle Using SQL*Plus	122
	Monitoring the Database Alert Log	122
	Summary	125
	Exam Essentials	127
	Review Questions	129
	Answers to Review Questions	133
<b>Chapter 3</b>	<b>Database Storage and Schema Objects</b>	<b>135</b>
	Identifying Segments, Extents, and Data Blocks	136
	Managing Tablespaces	136
	Identifying Default Tablespaces	137
	Creating and Maintaining Tablespaces	138
	Obtaining Tablespace Information	145
	Managing Datafiles	151
	Working with Schema Objects	152
	Specifying Datatypes	152
	Creating Tables	158
	Working with Constraints	165
	Working with Indexes	172
	Working with Views	174
	Working with Sequences	175
	Summary	176
	Exam Essentials	176
	Review Questions	178
	Answers to Review Questions	182
<b>Chapter 4</b>	<b>Oracle Net Services</b>	<b>185</b>
	Network Design Considerations	186
	Network Complexity Issues	186
	Network Security Issues	187
	Interfacing Existing Systems with New Systems	188
	Network Responsibilities for the DBA	188
	Network Configurations	189
	Single-Tier Architecture	189
	Two-Tier Architecture	190
	N-Tier Architecture	190
	An Overview of Oracle Net Features	191
	Connectivity	192
	Manageability	193
	Scalability	194

Security	196
Accessibility	197
Configuring Oracle Net on the Server	198
Understanding the Oracle Listener	199
Managing Oracle Listeners	203
Dynamically Registering Services	224
Additional Configurations When Using Multiple Listeners	225
Troubleshooting Server-Side Connection Problems	227
Oracle Net Logging and Tracing on the Server	233
Configuring Oracle Net for the Client	238
Client-Side Names Resolution Options	238
The Hostnaming Method	239
The Oracle Easy Connect Naming Method	244
The Localnaming Method	246
Troubleshooting Client-Side Connection Problems	254
Summary	259
Exam Essentials	260
Review Questions	263
Answers to Review Questions	267

## **Chapter 5 Oracle Shared Server 269**

An Overview of Oracle Shared Server	270
Dedicated Server versus Shared Server	271
Advantages and Disadvantages of Shared Server	273
Oracle Shared Server Infrastructure	274
PGA and SGA Changes When Using Oracle Shared Server	274
The Role of the Listener in an Oracle Shared Server Environment	276
Configuring the Oracle Shared Server	276
Defining the Shared Server Parameters	277
Configuring Shared Server at Database Creation	283
Configuring Shared Server Using Enterprise Manager	285
Managing Shared Server	288
Displaying Information about Shared Server Connections Using the Listener Utility	288
Using Dynamic Performance Views for Shared Server	289
Requesting a Dedicated Connection in a Shared Server Environment	294
Tuning the Shared Server Option	295
Configuring the Large Pool	296
Sizing the Large Pool	296
Determining Whether You Have Enough Dispatchers	297
Measuring How Long Users Are Waiting for Dispatchers	298
Determining Whether You Have Enough Shared Servers	299

	Summary	300
	Exam Essentials	301
	Review Questions	302
	Answers to Review Questions	306
<b>Chapter 6</b>	<b>User Administration and Security</b>	<b>309</b>
	Creating and Managing User Accounts	310
	Configuring Authentication	310
	Assigning a Default Tablespace	312
	Assigning a Temporary Tablespace	312
	Assigning a Profile to a User	313
	Removing a User from the Database	314
	Granting and Revoking Privileges	314
	Granting Object Privileges	314
	Granting System Privileges	318
	Role Privileges	324
	Controlling Resource Usage by Users	327
	Assigning Tablespace Quotas	328
	Assigning Resource Limits with a Profile	328
	Applying the Principle of Least Privilege	331
	Managing Default User Accounts	333
	Implementing Standard Password Security Features	334
	Auditing Database Activity	336
	Managing Statement Auditing	338
	Managing Privilege Auditing	343
	Managing Object Auditing	344
	Purging the Audit Trail	345
	Managing Fine-Grained Auditing	346
	Summary	349
	Exam Essentials	349
	Review Questions	351
	Answers to Review Questions	355
<b>Chapter 7</b>	<b>Managing Data with SQL, PL/SQL, and Utilities</b>	<b>357</b>
	Manipulating Data through SQL	358
	Using <i>INSERT</i> Statements	358
	Using <i>UPDATE</i> Statements	361
	Using <i>DELETE</i> Statements	362
	Identifying PL/SQL Objects	363
	Working with Functions	363
	Working with Procedures	365
	Working with Packages	365
	Working with Triggering Events and Managing Triggers	367
	Using and Administering PL/SQL Programs	371

	Configuring PL/SQL for Better Performance	373
	Creating Directory Objects	374
	Data Pump Overview	374
	Using Data Pump to Export Data	375
	Using Data Pump to Import Data	381
	Monitoring the Progress of a Data Pump Job	388
	Loading Data with SQL*Loader	388
	Specifying SQL*Loader Command-Line Parameters	389
	Specifying Control File Options	390
	Summary	393
	Exam Essentials	394
	Review Questions	395
	Answers to Review Questions	399
<b>Chapter 8</b>	<b>Managing Consistency and Concurrency</b>	<b>401</b>
	Leveraging Undo Management	402
	Understanding Undo Segments	403
	Using Undo Data	405
	Monitoring, Configuring, and Administering Undo	407
	Monitoring Locking and Resolving Lock Conflicts	416
	Understanding Locks and Transactions	416
	Maximizing Data Concurrency	417
	Detecting and Resolving Lock Conflicts	419
	Summary	422
	Exam Essentials	423
	Review Questions	424
	Answers to Review Questions	429
<b>Chapter 9</b>	<b>Proactive Database Maintenance and Performance Monitoring</b>	<b>431</b>
	Proactive Database Maintenance	432
	Automatic Workload Repository	432
	Automatic Database Diagnostic Monitoring	435
	ADDM Diagnostic Advisors	445
	ADDM Alerts	463
	Performance Monitoring	471
	Sources of Tuning Information	471
	Storing Database Statistics in the Data Dictionary	480
	Important Performance Metrics	485
	Summary	489
	Exam Essentials	491
	Review Questions	492
	Answers to Review Questions	497

## xvi Contents

<b>Chapter 10</b>	<b>Implementing Database Backups</b>	<b>499</b>
	Understanding and Configuring Recovery Components	501
	Control Files	501
	Understanding Checkpoints	505
	Redo Log Files	506
	Archived Redo Log Files	514
	The Flash Recovery Area	518
	Performing Backups	521
	Understanding Backup Terminology	521
	Backing Up the Control File	522
	Using RMAN to Create Backups	525
	Managing Backups	530
	Catalog Maintenance	530
	Monitoring the Flash Recovery Area	531
	Automating Backups	532
	Summary	534
	Exam Essentials	534
	Review Questions	536
	Answers to Review Questions	540
<b>Chapter 11</b>	<b>Implementing Database Recovery</b>	<b>543</b>
	Understanding Database Failure Types	544
	Statement Failures	545
	User Process Failures	545
	Network Failures	546
	User Error Failures	546
	Instance Failures	547
	Media Failures	547
	Performing Recovery Operations	548
	Understanding Instance Startup	548
	Keeping an Instance from Failing	550
	Recovering from Instance Failure	550
	Tuning Instance Recovery	551
	Recovering from User Errors	552
	Recovering from Loss of a Control File	564
	Recovering from Loss of a Redo Log File	566
	Recovering from Loss of a System-Critical Datafile	569
	Recovering from Loss of a Non-System-Critical Datafile	573
	Summary	578
	Exam Essentials	578
	Review Questions	580
	Answers to Review Questions	585
	<b>Glossary</b>	<b>587</b>
	<i>Index</i>	605