

# Oracle Database Foundations (novice-level exam)

## 考试大纲

## **What is a Database?**

### **Database Concepts**

- Describe the components of a database system
- Explain the purpose of a database

### **Types of Databases Models**

- Describe types of database models (relational, object oriented, flat, network...)
- Compare the differences between the different types of databases

### **Relational Database Concepts**

- Describe the characteristics of a relational database
- Explain the importance of relational databases in business
- List the major transformations in database technology

### **Defining Levels of Data Abstraction**

- Define the terminology used for database storage
- Describe levels of data abstraction used in relational databases

### **Gathering Requirements for Database Design**

- Gather requirements to implement a database solution
- Explain business rules

## **The Language of Database and Data Modeling**

### **Defining a Table in a Database**

- Describe the structure of a single table

### **Using Conceptual Data Modeling**

- Describe a conceptual data model
- Explain the components of a conceptual/logical model

### **Defining Instance and Schema in Relational Databases**

- Examine examples of an entity and a corresponding table
- Examine examples of an attribute and a corresponding column
- Explain instances and schemas in a relational database

### **Using Unique Identifiers, Primary and Foreign Keys**

- Identify unique identifiers and a corresponding primary key
- Define composite and compound primary keys
- Define relationships and corresponding foreign keys
- Define barred relationships and the corresponding primary keys

## **Data Modeling – Creating the Physical Model**

### **Creating Physical Data Models**

- Create a physical data model
- Compare conceptual and physical data models

### **Documenting Business Requirements and Rules**

- Explain the importance of clearly communicating and accurately capturing database information requirements
- Identify structural business rules
- Identify procedural business rules
- Identify business rules that must be enforced by additional programming (eg SQL)

### **Defining Supertype and Subtype Entity Relationships**

- Describe an example of an entity
- Define supertype and subtype entities
- Implement rules for supertype and subtype entities

### **Using Attributes**

- Describe attributes for a given entity
- Identify and provide examples of instances
- Distinguish between mandatory and optional attributes
- Distinguish between volatile and nonvolatile attributes

### **Using Unique Identifiers (UIDs)**

- Define the types of unique identifiers
- Select a unique identifier using business rules
- Define a candidate unique identifier
- Define an artificial unique identifier

### **Identifying Relationships**

- Explain one-to-one, one-to-many, and many-to-many relationships
- Identify the optionality necessary for a relationship
- Identify the cardinality necessary for a relationship

- Identify nontransferable relationships
- Name a relationship
- Create ERDish sentences to represent ERDs
- Create ERDs to represent ERDish sentences

### **Resolving Many to Many Relationships and Composite Unique Identifiers**

- Resolve a many-to-many relationship using an intersection entity
- Identify the variations of unique identifiers after creation of an intersection entity
- Define a barred relationship
- Identify composite unique identifiers

### **Identifying Hierarchical, Recursive, and Arc Relationships**

- Define a hierarchical relationship
- Define a recursive relationship
- Define an arc relationship
- Identify UIDs in a hierarchical, recursive and arc relationship model
- Construct a model using recursion and hierarchies
- Identify similarities and differences in an arc relationship and a supertype/subtype entity

### **Tracking Data Changes Over Time**

- Explain necessity of tracking data changes over time
- Identify data that changes over time
- Identify the changes in unique identifiers after adding the element of time to an ERD

### **Validating Data Using Normalization**

- Define the purpose of normalization
- Define the rules of First, Second, and Third Normal Forms
- Apply the rules of First, Second, and Third Normal Form

## **Mapping the Physical Model**

### **Mapping Entities, Columns and Data Types**

- Map entities to identify database tables to be created from an ERD
- Identify column data types from an ERD
- Identify common data types used to store values in a relational database

### **Mapping Primary, Composite Primary and Foreign Keys**

- Identify primary keys from an ERD
- Identify which ERD attributes would make candidate primary keys

- Describe the purpose of a foreign key in an Oracle Database
- Identify foreign keys from an ERD
- Describe the relationship between primary keys, composite primary keys, and foreign keys in an Oracle Database

## **Introduction to SQL**

### **Using Structured Query Language (SQL)**

- Explain the relationship between a database and SQL

### **Using Data Definition Language (DDL)**

- Describe the purpose of DDL
- Use DDL to manage tables and their relationships

### **Using Data Manipulation Language (DML) and Transaction Control Language (TCL)**

- Describe the purpose of DML
- Use DML to manage data in tables
- Use TCL to manage transactions

### **Defining and using Basic Select statements**

- Identify the connection between an ERD and a Relational Database using SQL SELECT statements
- Build a SELECT statement to retrieve data from an Oracle Database table
- Use the WHERE clause to the SELECT statement to filter query results

### **Displaying Sorted Data**

- Use the ORDER BY clause to sort SQL query results

### **Defining Table Joins**

- Describe the different types of joins and their features
- Use joins to retrieve data from multiple tables