Arkansas CTE

Oracle - Database Programming: Grades 11, 12

Adopted 2006

Number, Date, and Conversion Functions

1.1 Define terminology

1. Prepare a list of terms with definitions 1.1.1

1.2 Discuss the difference between single row and multiple row subqueries

1. Demonstrate the difference between single row and multiple row subqueries 1.2.1

1.3 Identify single row functions that perform case conversions

1. Apply single row functions that perform case conversions 1.3.1

1.4 Select and apply character case-manipulation functions LOWER, UPPER, and INITCAP in an SQL query

1. Prepare the code to run in HTML DB 1.4.1

1.5 Select and apply character case-manipulation functions CONCAT, SUBSTR, LENGTH, INSTR, LPAD, RPAD, TRIM, and REPLACE in an SQL query

1. Prepare the code to run in HTML DB 1.5.1

1.6 Select and apply the single-row number functions ROUND, TRUNC, and MOD in an SQL query

1. Prepare the code to run in HTML DB 1.6.1

1.7 Distinguish between the results obtained when TRUNC is applied to a numeric value and ROUND is applied to a numeric value

1. Discuss the results obtained when TRUNC is applied to a numeric value and ROUND is applied to a numeric value 1.7.1

1.8 State the implications for business when applying TRUNC and ROUND to numeric values

1. Discuss the difference between TRUNC and ROUND 1.8.1

1.9 Analyze and understand IT career options and education requirements based on interests, abilities, aptitudes, and accomplishments

1. Research IT career options and education 1.9.1

1.10 Demonstrate skills for locating, evaluating, and interpreting IT career information

1. Prepare a chart showing the IT career information `1.10.1`

1.11 Apply concepts learned as a result of student's own work and academic experiences, and evaluate the application of skills to career options and the world of work

1. Explain the student concepts and evaluate the applications `1.11.1`

1.12 Give an example of an explicit data-type conversion and an implicit data-type conversion

1. Discuss an example of an explicit data-type conversion and an implicit data-type conversion `1.12.1`

1.13 Explain why it is important, from a business perspective, for a language to have built-in data-conversion capabilities

1. Prepare an example of why it is important, from a business perspective, for a language to have built-in data-conversion capabilities `1.13.1`

1.14 Construct a SQL-query that correctly applies TO_CHAR, TO_NUMBER, and TO_DATE single row functions to produce a desired result

1. Prepare the code to run in HTML DB `1.14.1`

1.15 Apply the appropriate date and/or character format model to produce a desired output

1. Prepare the code to run in HTML DB `1.15.1`

1.16 Explain and apply the use YYYY and RRRR to return the correct year as stored in the database

1. Write the code to use a DUAL `1.16.1`

1.17 Explain the evaluation of a nested function

1. Demonstrate the evaluation of a nested function `1.17.1`

1.18 List at least four general functions that work with any data type and relate to handling null values

1. Create a chart showing the four functions `1.18.1`

1.19 Explain the use of COALESCE and the NVL functions

1. Demonstrate the use of COALESCE and the NVL functions `1.19.1`

1.20 Construct and execute a SQL query that correctly applies NVL, NVL2, NULLIF, and COALESCE single-row functions

1. Write the code to use a HTML DB `1.20.1`

1.21 Compare and contrast the DECODE and CASE functions

1. Demonstrate the use of DECODE and CASE functions `1.21.1`

1.22 Construct and execute a SQL query that correctly uses the DECODE and CASE functions

1. Write the code to use a HTML DB `1.22.1`

1.23 Construct and execute two methods for implementing IF-THEN-ELSE conditional logic

1. Write the code to use a HTML DB `1.23.1`

Joins

2.1 Define terminology

1. Prepare a list of terms with definitions `2.1.1`

2.2 Identify the purpose of joins conditions

1. Demonstrate the purpose of joins conditions `2.2.1`

2.3 Discuss how to construct and execute a SELECT statement that results in a cartesian product

1. Create a SELECT statement that results in a cartesian product `2.3.1`

2.4 Discuss how to construct and execute a SELECT statement to access data from more than one table using an equijoin

1. Create a SELECT statement to access data from more than one table using an equijoin `2.4.1`

2.5 Discuss how to construct and execute a SELECT statement that add search conditions using the AND operator

1. Create a SELECT statements that add search conditions using the AND operator `2.5.1`

2.6 Discuss how to apply the rule for using column aliases in a join statement

1. Create a column alias in a join statement `2.6.1`

2.7 Discuss why it is it important, from a business perspective, for a language to be able to combine information from multiple data sources

1. Demonstrate why is it important, from a business perspective, for a language to be able to combine information from multiple data sources `2.7.1`

2.8 Discuss how to construct and execute a SELECT statement to access data from more than one table using a nonequijoin

1. Create a SELECT statement to access data from more than one table using a nonequijoin `2.8.1`

2.9 Discuss how to SELECT and execute a statement to access data from more than one table using an outer join

1. Create a SELECT statement to access data from more than one table using an outer join `2.9.1`

2.10 Illustrate positive associations between learning and work

1. Discuss examples of positive associations between learning and work `2.10.1`

2.11 Discuss how to construct and execute a SELECT statement to join a table to itself using a self-join

1. Create a SELECT statement to join a table to itself using a self-join `2.11.1`

2.12 Identify factors that contribute to the changing nature of work

1. Discuss examples of factors that contribute to the changing nature of work `2.12.1`

2.13 Illustrate how to incorporate into a career plan skills to stay up-to-date in anticipation of the changing nature of work

1. Demonstrate how to incorporate into a career plan skills to stay up-to-date in anticipation of the changing nature of work `2.13.1`

2.14 Discuss how to compose and execute a natural join using SQL join syntax

1. Create a query using SQL join syntax that will execute a natural join `2.14.1`

2.15 Discuss how to create a Cartesian product using SQL join syntax

1. Create a query using SQL joint syntax that will result in a Cartesian product `2.15.1`

2.16 Discuss the relationship between a cross-join and a Cartesian product

1. Demonstrate the relationship between a cross-join and a Cartesian product `2.16.1`

2.17 Discuss the relationship between a natural join and an equijoin

1. Demonstrate the relationship between a natural join and an equijoin `2.17.1`

2.18 Discuss why it is important to have a standard for SQL as defined by ANSI

1. Demonstrate why it is important to have a standard for SQL as defined by ANSI `2.18.1`

2.19 Discuss how to compose and execute a join with the USING and ON clauses

1. Create a join with the USING and ON clauses `2.19.1`

2.20 Discuss how to compose and execute an ANSI/SO SQL: 1999 query that joins three tables

1. Create an ANSI/SO SQL: 1999 query that joins three tables `2.20.1`

2.21 Name the Oracle proprietary joins and their ANSI/SO SQL: 1999 counterparts

1. Demonstrate the Oracle proprietary joins and their ANSI/SO SQL: 1999 counterparts `2.21.1`

2.22 Compare and contrast an inner and outer join

1. Demonstrate inner and outer joins `2.22.1`

2.23 Discuss how to construct and execute a query to use a left outer join

1. Create a query that uses a left outer join `2.23.1`

2.24 Discuss how to construct and execute a query to use a right outer join

1. Create a query that uses a right outer join `2.24.1`

2.25 Discuss how to construct and execute a query to use a full outer join

1. Create a query that uses a full outer join `2.25.1`

2.26 Construct and execute a query to use an inner join

1. Write an HTML query that uses an inner join `2.26.1`

Group Functions and Subqueries

3.1 Define terminology

1. Prepare a list of terms with definitions `3.1.1`

3.2 Explain the seven group functions: AVG, COUNT, MAX, MIN, STUDDEV, SUM, VARIANCE

2. Research and give an example of the seven group functions `3.2.2`

3.3 Discuss how to construct and execute a SQL query using SELECT, FROM, WHERE, GROUP BY, ORDER BY syntax using group functions

1. Diagram a SQL query using SELECT, FROM, WHERE, GROUP BY, ORDER BY syntax using group functions `3.3.1`

3.4 Discuss how to construct and execute group functions that operate only with numeric data types

1. Construct and execute group functions that operate only with numeric data types `3.4.1`

3.5 Discuss how to construct and execute group functions that operate to produce a single value

1. Illustrate how to construct and execute a group function that will operate to produce a single value `3.5.1`

3.6 Compare and contrast the results set obtained from single-row functions versus group functions

1. Discuss the results set obtained from single-row functions versus group functions `3.6.1`

3.7 Discuss why is it important, from a business perspective, to be able to easily aggregate data (group)

1. What business problems does this solve? `3.7.1`

3.8 Discuss how to construct and execute a SQL query applying COUNT, DISTINCT, NVL group functions

1. Give examples of how to construct a SQL query applying COUNT, DISTINCT, NVL group functions `3.8.1`

3.9 Differentiate between different kinds of interviews and the purposes of each

1. Demonstrate the different kinds of interviews and the purpose of each `3.9.1`

3.10 List specific steps needed to better prepare for a job interview

1. Create specific steps needed to better prepare for a job interview `3.10.1`

3.11 Identify the types of questions that cannot be asked during an interview

1. Research the types of questions that cannot be asked in an interview `3.11.1`

3.12 Explain the importance of a first impression in the interview process

1. Discuss the importance of the first impression in the interview process `3.12.1`

Data Management Language

4.1 Define terminology

1. Prepare a list of terms with definitions `4.1.1`

4.2 Construct a MERGE statement

1. Execute a MERGE statement `4.2.1`

4.3 List each of the number, character, and date data types

1. Create a table with examples of the number, character, and date data types `4.3.1`

4.4 Create a table applying the appropriate data type for each column

1. Diagram the appropriate uses of each data type `4.4.1`

4.5 Discuss tables incorporating TIMESTAMP, INTERVAL YEAR TO MONTH, AND INTERVAL DAY TO SECOND data types to columns

1. Create a table incorporating TIMESTAMP, INTERVAL YEAR TO MONTH, AND INTERVAL DAY TO SECOND data types `4.5.1`

4.6 Discuss how an organization use time stamps for time zones in business situations

1. Research a list of examples of how businesses use time stamps for time zones 4.6.1

4.7 Articulate the changing nature of work and its associated educational requirements

1. Research the changes in work and educational requirements 4.7.1

4.8 Discuss each of the DDL statements: ALTER, DROP, RENAME, and TRUNCATE and discuss the effect each has on tables and columns

1. Give examples of each DDL statement: ALTER, DROP, RENAME, and TRUNCATE and show the effect each has on tables and columns 4.8.1

4.9 Discuss why it is important to be able to modify a table

1. Demonstrate the importance of being able to modify tables 4.9.1

4.10 Discuss how to construct a query using the ALTER TABLE commands ADD, MODIFY, and DROP

1. Execute a query using the ALTER TABLE commands ADD, MODIFY, and DROP 4.10.1

4.11 Discuss the rationale for using TRUNCATE vs. DELETE for tables

1. Provide a list of differences between TRUNCATE vs. DELETE 4.11.1

4.12 Discuss adding a comment to a table using the COMMENT ON TABLE command

1. Create a table and add a comment using COMMENT ON TABLE command 4.12.1

4.13 Identify the changes that can and cannot be made to modify a column

1. Create a list of examples of changes that can and cannot be made to modify a column 4.13.1

4.14 Discuss the guidelines for dropping a column when constraints are present

1. Create a list of examples of dropping columns when constraints are present 4.14.1

4.15 Discuss when and why the SET UNUSED statement is advantageous

1. Diagram when and why the SET UNUSED statement is advantageous 4.15.1

4.16 List the guidelines related to using a DROP TABLE statement

1. Create a chart explaining each guideline 4.16.1

4.17 Discuss the term constraint as it relates to data integrity

1. Create a list of ways to use constraints 4.17.1

4.18 Discuss NOT NULL and a UNIQUE constraint

1. Demonstrate NOT NULL and a UNIQUE constraint in a new table `4.18.1`

4.19 Identify two reasons why constraints are incorporated into table definitions

1. Create one example for each reason constraints are incorporated into table definitions `4.19.1`

4.20 Discuss why it is important, from a business perspective, for a language to have built-in constraint-checking capability

1. Research and provide evidence to support the assigned topic `4.20.1`
2. Research ways a business can use all of them together `4.20.2`

4.21 Evaluate a business problem that would involve a new table with NOT NULL and UNIQUE constraints

1. Write and display a code for both NOT NULL and UNIQUE constraints `4.21.1`

4.22 Discuss PRIMARY KEY, FOREIGN KEY, and CHECK constraints

1. Create a table using an example of PRIMARY KEY, FOREIGN KEY, and CHECK constraints `4.22.1`

4.23 Discuss the purpose of defining PRIMARY KEY, FOREIGN KEY, and CHECK constraints

1. Explain each term as it is used in a table `4.23.1`

4.24 Discuss how to use the CREATE TABLE

1. Demonstrate the creation of constraints at the column level and table level in a CREATE TABLE statement `4.24.1`

4.25 Evaluate a business problem requiring the addition of a PRIMARY KEY and FOREIGN KEY constraint

1. Write the code to execute the addition of a PRIMARY KEY and FOREIGN KEY; demonstrate them by creating a table `4.25.1`

4.26 Differentiate between checking vs. constraint management

1. Demonstrate the different ways of using constraints `4.26.1`

4.27 List three different functions that the ALTER statement can perform on constraints

1. Demonstrate how each ALTER statement works `4.27.1`

4.28 Name a business function that would require a DBA to drop, enable, and/or disable a constraint or use the CASCADE

1. Identify the function that requires DBA rights `4.28.1`

4.29 Evaluate a business problem to modify an existing table with new constraints

1. Write the code to resolve the problem `4.29.1`

4.30 Discuss the different activities that a database administrator might perform with regard to constraints

1. Research evidence to support the assigned topic `4.30.1`

Transforming from the Conceptual to the Physical

5.1 Define terminology

1. Prepare a list of terms with definitions `5.1.1`

5.2 Identify entity relationship models and database models

1. Distinguish entity relationship models from database models `5.2.1`

5.3 Compare and contrast the conceptual and physical data models

1. Describe the terminology mapping between a conceptual model and a relational database model `5.3.1`

5.4 Discuss the rule of basic mapping to transform an entity into a table

1. Apply the rule of basic mapping to transform an entity into a table `5.4.1`

5.5 Recall the rule of Oracle naming conventions for tables and columns used in relational models

1. Apply the rule of Oracle naming conventions for tables and columns used in relational models `5.5.1`

5.6 Recall the rule of relationship mapping to correctly transform one to many and barred relationships

1. Apply the rule of relationship mapping to correctly transform one to many and barred relationships `5.6.1`

5.7 Recall the rule of relationship mapping to correctly transform many-to-many relationships

1. Apply the rule of relationship mapping to correctly transform many-to-many relationships `5.7.1`

5.8 Recall the rule of relationship mapping to correctly transform one-to-one relationships

1. Apply the rule of relationship mapping to correctly transform one-to-one relationships `5.8.1`

5.9 Recall the rule of relationship mapping to correctly transform relationships in an arc

1. Apply the rule of relationship mapping to correctly transform relationships in an arc `5.9.1`

5.10 Recall the table, column, identifiers, relationship, and integrity restraint rules for mapping supertype implementations

1. State and apply the table, column, identifiers, relationship, and integrity restraint rules for mapping supertype implementations `5.10.1`

5.11 Recall the table, column, identifiers, relationship, and integrity restraint rules for mapping subtype implementations

1. State and apply the table, column, identifiers, relationship, and integrity restraint rules for mapping subtype implementations `5.11.1`

5.12 Recall the table, column, identifiers, relationship, and integrity restraint rules for mapping supertype and subtype arc implementations

1. State and apply the table, column, identifiers, relationship, and integrity restraint rules for mapping supertype and subtype arc implementations `5.12.1`

5.13 Discuss how to create a table in HTML DB using a provided SQL script

1. Create a table in HTML DB using a provided SQL script `5.13.1`

5.14 Discuss entering data into an existing table using a provided SQL script

1. Enter sample data into an existing table using a provided SQL script `5.14.1`
2. Query a table to view data using a provided SQL script `5.14.2`

Knowledge

6.1 Define terminology

1. Prepare a list of terms with definitions `6.1.1`

6.2 Explain Integrity Rule as it relates to database tables

1. Create a table following the Integrity Rule `6.2.1`

6.3 Identify table, row, column, primary key, unique key, and foreign key given in a diagram containing them

1. Printout a table and identify the rows, columns, UID, FK `6.3.1`

6.4 Identify violations of data-integrity rules

1. Correct violations of data-integrity rules `6.4.1`

6.5 Recall the rules of SQL to display all columns of a table

1. Apply the rules of SQL to display all columns of a table `6.5.1`

6.6 Recall the rules of SQL to display a subset of the columns of a table specified by criteria

1. Apply the rules of SQL to display a subset of the columns of a table specified by criteria `6.6.1`

6.7 Explain how to add new data to a table containing 4 columns

1. Apply the rules of SQL to add new data to a table containing 4 columns `6.7.1`

6.8 Explain how to add a new column to an existing table

1. Apply the rules of SQL to add a new column to an existing table `6.8.1`

6.9 Discuss applications of DELETE

1. Use the DELETE and ALTER TABLE `6.9.1`

6.10 Illustrate a data-modeling project

1. Use a data-modeling project to salve a business information need `6.10.1`

6.11 Discuss solutions to business problems using database technology

1. Work as a group to solve business problems using database technology `6.11.1`

6.12 Illustrate a database solution to a business problem

1. Create and present a database solution to a business problem `6.12.1`

6.13 Explain the different stages of the system development lifecycle

1. List and describe the different stages of the system development lifecycle `6.13.1`

6.14 Explain the role of data modeling in the system development lifecycle

1. Explain the purpose of data modeling `6.14.1`

6.15 Discuss the relationship between project tasks to the different stages of the system development lifecycle

1. Correctly apply relationships to List of Values (LOV) in an organizational hierarchy `6.15.1`

6.16 Recall how to implement tables from an ERD

1. Use HTML DB to implement tables from an ERD `6.16.1`

6.17 Recall how to issue SQL queries in HTML DB

1. Produce query output using HTML DB `6.17.1`

6.18 Explain the features and benefits that Oracle Database Environment provides for businesses

1. Identify & describe the efficiency, accuracy, flexibility, workflow, & reporting qualities of Oracle `6.18.1`

6.19 Compare and contrast application software and system software

1. Identify key differences between application software and system software `6.19.1`

6.20 Identify the appropriate SQL functions to perform projection, selection, and join

1. Use the correct syntax to perform projection, selection, & join `6.20.1`

6.21 Discuss the correct syntax to perform arithmetic expressions on the columns of a query

1. Use the correct syntax to perform arithmetic expressions on the columns of a query `6.21.1`

6.22 Recall correct operator precedence to display desired results

1. Formulate queries using correct operator precedence to display desired results `6.22.1`

6.23 Compare and contrast the concepts of null, zero and an empty string

1. Categorize the concepts of null, zero, and an empty string `6.23.1`

6.24 Recall the effect null values have in arithmetic expressions

1. Demonstrate the effect null values have in arithmetic expressions `6.24.1`

6.25 Discuss how to use a column alias

1. Construct a query using a column alias `6.25.1`

6.26 Recall how to use the concatenation operator

1. Apply the concatenation operator to link column values and expressions to create a character expression `6.26.1`

6.27 Discuss use of literal values of type character, number, and date

1. Use literal values of type character, number, and date in a SQL SELECT statement `6.27.1`

6.28 Define and use DISTINCT to eliminate duplicates in query results

1. Apply DISTINCT to eliminate duplicates in query results `6.28.1`

6.29 Discuss the structure of a table using DESCRIBE

1. Display the structure of a table using DESCRIBE `6.29.1`

6.30 Illustrate the use of HTML DB to run, edit, and save SQL statements

1. Edit, execute, and save SQL statements in HTML DB `6.30.1`

6.31 Discuss how to access self test software to review for certification exam

1. Demonstrate the ability to log into the self test software `6.31.1`

6.32 Discuss how to use WHERE clause to restrict rows returned in a SQL query

1. Apply the WHERE clause to restrict rows returned in a SQL query `6.32.1`

6.33 Explain why it is important to be able to easily limit data retrieved from a table

1. Construct a query that limits or restricts a column or row `6.33.1`

6.34 Explain the use of logical comparisons to restrict the rows returned based on two or more conditions

1. Evaluate logical comparisons to restrict the rows returned based on two or more conditions `6.34.1`

6.35 Explain the rules of precedence by which expressions are evaluated and calculated

1. Apply the rules of precedence to determine the order in which expressions are evaluated and calculated `6.35.1`

6.36 Identify a query to sort a result set in ascending or descending order

1. Construct a query to sort a result set in ascending or descending order `6.36.1`

6.37 Identify a query to order a result set using a column alias

1. Construct a query to order a result set using a column alias `6.37.1`

6.38 Identify a query to order a result set for single or multiple columns

1. Construct a query to order a result set for single or multiple columns `6.38.1`

6.39 Identify appropriate applications of single-row functions in query statements

1. Use single-row functions in a query `6.39.1`

6.40 Identify a function as a single row or multiple row function

1. Classify a function as a single row or multiple row function `6.40.1`

6.41 Compare and contrast the results returned by single row and multiple row functions

1. Categorize the results returned by a function as single row or multiple row `6.41.1`

HTML DB

7.1 Define terminology

1. Prepare a list of terms with definitions `7.1.1`

7.2 Discuss using SQL concepts to create a functional database appropriate for a small business

1. Using SQL you will form a database for a small business 7.2.1
2. Using SQL form a database for a small business with a new list of values 7.2.2
3. Using HTML DB SQL input data for the businesses customers, subjects, publishers, and item types 7.2.3
4. Create and produce reports for customers orders using ORDER in the input form and report page 7.2.4

7.3 Discuss how to use Oracle HTML DB SQL Workshop to create table components and layouts using a wizard

1. Use Oracle's HTML DB SQL to make a table using layouts from a wizard 7.3.1

7.4 Use Oracle HTML DB SQL Workshop to create the application's pages, page style, and popup list of values (LOVs) using a wizard

1. Using Oracle's HTML DB SQL create application pages, different page styles, and a list of values 7.4.1

7.5 Use Oracle HTML DB SQL Workshop to create input forms using a wizard

1. Using Oracle's HTML DB SQL create input forms 7.5.1

7.6 Describe how to input data into the CUSTOMERS, SUBJECTS, PUBLISHERS, and ITEM_TYPES tables using a wizard

1. Create input forms to report areas for applications such as orders and items 7.6.1

7.7 Discuss how to create input forms and report areas for the application's ORDERS and ITEMS pages to enable use of the LOVs for inputting data using a wizard

1. Format the report pages 7.7.1

7.8 Discuss how to create and produce reports about customer orders using the ORDER input form and report page

1. Create charts to display summary data 7.8.1

7.9 Explain how to format report pages

1. Present to class functional database created along with data, reports, and forms 7.9.1

Database Operations

8.1 Define terminology

1. Prepare a list of terms with definitions 8.1.1

8.2 List three advantages of the COMMIT, ROLLBACK, and SAVEPOINT statements

1. List three advantages using these statements 8.2.1

8.3 Explain why it is important, from a business perspective, to be able to control the flow of transaction processing

1. Explain the importance of controlling the flow of transaction processing `8.3.1`

8.4 Explain the difference between system security and data security as it relates to a database

1. Explain differences between system security and data security `8.4.1`

8.5 Discuss why it is important, from a business perspective, to be able to set up user accounts with different types of access permissions

1. Research and provide evidence to support the assigned topic `8.5.1`

8.6 List 5 system privileges and explain their functions

1. List five system privileges with function explanation `8.6.1`

8.7 Write a statement to create a user

1. Write a statement to create a user `8.7.1`

8.8 Write a statement to GRANT privileges such as CREATE SESSION, CREATE TABLE, CREATE SEQUENCE, CREATE VIEW, and CREATE PROCEDURE

1. Write a statement to grant these privileges `8.8.1`

8.9 Define and explain the advantages of a role

1. Define with explanation of the advantages of a role `8.9.1`

8.10 Define a database link and explain the object privileges that apply with a remote database

1. Define database links with explanation of object privileges `8.10.1`