

Databases

1. Database Design

- 1.1 Given a scenario, design tables for storing data
 - Identify entities, rows/records, columns/fields
- 1.2 Given a scenario, identify the appropriate primary key
 - Primary key, composite/compound key
- 1.3 Given a scenario, choose data types to meet requirements
 - Definition and importance of data types; how data types affect storage requirements; data types for storing text, numbers, dates and times, and Boolean values
- 1.4 Given a scenario, design relationships between tables
 - How to establish relationships using primary and foreign keys, entity-relationship diagrams (ERDs), referential integrity
- 1.5 Normalize a database
 - Reasons for normalization, how to normalize a database to third normal form (3NF)
- 1.6 Given a scenario, identify data protection measures
 - Backups, restore, principle of least privilege , GRANT, WITH GRANT OPTION, REVOKE, purpose of roles

2. Database Object Management using DDL

- 2.1 Construct and analyze queries that create, alter, and drop tables
 - Create, alter, and drop tables by using proper ANSI SQL syntax; NULL and NOT NULL
- 2.2 Construct and analyze queries that create, alter, and drop views
 - Create, alter, and drop views by using proper ANSI SQL syntax; purpose of views
- 2.3 Construct and analyze stored procedures and functions
 - Input and output parameters, return values, purpose of stored procedures
- 2.4 Given a scenario, choose between clustered and non-clustered indexes
 - When to use clustered vs. non-clustered indexes, syntax for creating indexes

3. Data Retrieval

- 3.1 Construct and analyze queries that select data
 - INNER JOIN, LEFT JOIN, RIGHT JOIN, CROSS JOIN (Cartesian product), and FULL OUTER JOIN; self joins; combine result sets by using UNION and INTERSECT; DISTINCT; column alias; computed columns

IT SPECIALIST EXAM OBJECTIVES

- 3.2 Construct and analyze queries that sort and filter data
 - ORDER BY, WHERE, LIKE, BETWEEN, AND, OR, NOT, TOP (LIMIT), IN, NOT IN, ANY, ALL, NULL, NOT NULL, comparison operators
- 3.3 Construct and analyze queries that aggregate data
 - GROUP BY, HAVING, MIN, MAX, COUNT, AVG (AVERAGE), SUM

4. Data Manipulation using DML

- 4.1 Construct and analyze INSERT statements
 - INSERT INTO SELECT, INSERT INTO VALUES
- 4.2 Construct and analyze UPDATE statements
 - Update data in a single table
- 4.3 Construct and analyze DELETE statements
 - Delete data from a single table

5. Troubleshooting

- 5.1 Troubleshoot data object management query failures
 - Syntax and runtime errors
- 5.2 Troubleshoot data retrieval query failures
 - Syntax and runtime errors
- 5.3 Troubleshoot data manipulation query failures
 - Syntax and runtime errors



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