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| 1. Business intelligence is a framework that allows a business to transform data into information, information into knowledge, and knowledge into wisdom.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-2 Business Intelligence | | *LEARNING OBJECTIVES:* | 13.02 - Describe the architecture, reporting styles, evolution, and benefits of business intelligence | |

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| 2. Business intelligence (BI) architecture is composed of data, people, processes, and technology working together to facilitate and enhance a business’s management and governance.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-2a Business Intelligence Architecture | | *LEARNING OBJECTIVES:* | 13.02 - Describe the architecture, reporting styles, evolution, and benefits of business intelligence | |

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| 3. A data store is used by data analysts to create queries that access the database.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-2a Business Intelligence Architecture | | *LEARNING OBJECTIVES:* | 13.02 - Describe the architecture, reporting styles, evolution, and benefits of business intelligence | |

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| 4. Master data management’s main goal is to provide a partial and segmented definition of all data within an organization.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-2a Business Intelligence Architecture | | *LEARNING OBJECTIVES:* | 13.02 - Describe the architecture, reporting styles, evolution, and benefits of business intelligence | |

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| 5. Operational data and decision support data serve the same purpose.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-3a Operational Data versus Decision Support Data | | *LEARNING OBJECTIVES:* | 13.03 - Differentiate between operational data and decision support data | |

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| 6. Decision support data is a snapshot of the operational data at a given point in time.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-3a Operational Data versus Decision Support Data | | *LEARNING OBJECTIVES:* | 13.03 - Differentiate between operational data and decision support data | |

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| 7. Queries against operational data typically are broad in scope and high in complexity.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-3a Operational Data versus Decision Support Data | | *LEARNING OBJECTIVES:* | 13.03 - Differentiate between operational data and decision support data | |

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| 8. Data warehouse data are organized and summarized by table, such as CUSTOMER and ADDRESS.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-4 The Data Warehouse | | *LEARNING OBJECTIVES:* | 13.04 - Identify the purpose, characteristics, and components of a data warehouse | |

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| 9. Relational data warehouses use the star schema design technique to handle multidimensional data.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-4b Twelve Rules That Define a Data Warehouse | | *LEARNING OBJECTIVES:* | 13.04 - Identify the purpose, characteristics, and components of a data warehouse | |

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| 10. The data warehouse development life cycle differs from classical systems development.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-4b Twelve Rules That Define a Data Warehouse | | *LEARNING OBJECTIVES:* | 13.04 - Identify the purpose, characteristics, and components of a data warehouse | |

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| 11. A data warehouse designer must define common business dimensions that will be used by a data analyst to expand a search.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 13-5c Attributes | | *LEARNING OBJECTIVES:* | 13.05 - Develop star and snowflake schemas for decision-making purposes | |

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| 12. By default, the fact table’s primary key is always formed by combining the superkeys pointing to the dimension tables to which they are related.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-5e Star Schema Representation | | *LEARNING OBJECTIVES:* | 13.05 - Develop star and snowflake schemas for decision-making purposes | |

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| 13. Normalizing fact tables improves data access performance and saves data storage space.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-5f Performance-Improving Techniques for the Star Schema | | *LEARNING OBJECTIVES:* | 13.05 - Develop star and snowflake schemas for decision-making purposes | |

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| 14. Periodicity, usually expressed as current year only, previous years, or all years, provides information about the time span of the data stored in a table.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-5f Performance-Improving Techniques for the Star Schema | | *LEARNING OBJECTIVES:* | 13.05 - Develop star and snowflake schemas for decision-making purposes | |

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| 15. Multidimensional data analysis techniques include advanced computational functions.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 13-6a Multidimensional Data Analysis Techniques | | *LEARNING OBJECTIVES:* | 13.07 - Describe the role and functions of data analytics and data mining | |

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| 16. Advanced OLAP  feature become more useful when access to them is kept simple.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-6c Easy-to-Use End-User Interfaces | | *LEARNING OBJECTIVES:* | 13.07 - Describe the role and functions of data analytics and data mining | |

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| 17. A star schema is designed to optimize data query operations rather than data update operations.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-6e Relational OLAP | | *LEARNING OBJECTIVES:* | 13.07 - Describe the role and functions of data analytics and data mining | |

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| 18. ROLAP and MOLAP vendors are working toward the integration of their respective solutions within a unified decision support framework.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-6g Relational versus Multidimensional OLAP | | *LEARNING OBJECTIVES:* | 13.07 - Describe the role and functions of data analytics and data mining | |

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| 19. The ROLLUP extension is used with the GROUP BY clause to generate aggregates by the listed columns, including the last one.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 13-8a The ROLLUP Extension | | *LEARNING OBJECTIVES:* | 13.08 - Explain how SQL analytic functions are used to support data analytics | |

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| 20. The CUBE extension enables you to get a subtotal for each column listed in the expression, in addition to a grand total for the last column listed.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-8b The CUBE Extension | | *LEARNING OBJECTIVES:* | 13.08 - Explain how SQL analytic functions are used to support data analytics | |

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| Multiple Choice |

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| 21. A(n) \_\_\_\_\_ is optimized for decision support and is generally represented by a data warehouse or a data mart.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | data store | b. | ETL tool | |  | c. | data visualization | d. | data analysis tool |  |  |  | | --- | --- | | *ANSWER:* | a | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-2a Business Intelligence Architecture | | *LEARNING OBJECTIVES:* | 13.02 - Describe the architecture, reporting styles, evolution, and benefits of business intelligence | |

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| 22. \_\_\_\_\_ are in charge of presenting data to the end user in a variety of ways.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | Data stores | b. | ETL tools | |  | c. | Data visualization tools | d. | Data analysis tools |  |  |  | | --- | --- | | *ANSWER:* | c | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-2a Business Intelligence Architecture | | *LEARNING OBJECTIVES:* | 13.02 - Describe the architecture, reporting styles, evolution, and benefits of business intelligence | |

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| 23. \_\_\_\_\_  provide a unified, single point of entry for information distribution.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | Decision support systems | b. | Portals | |  | c. | Data warehouses | d. | Dashboards |  |  |  | | --- | --- | | *ANSWER:* | b | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-2a Business Intelligence Architecture | | *LEARNING OBJECTIVES:* | 13.02 - Describe the architecture, reporting styles, evolution, and benefits of business intelligence | |

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| 24. In business intelligence framework, data are captured from a production system and placed in \_\_\_\_\_ on a near real-time basis.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | decision support system | b. | portal | |  | c. | data warehouse | d. | dashboard |  |  |  | | --- | --- | | *ANSWER:* | c | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-2a Business Intelligence Architecture | | *LEARNING OBJECTIVES:* | 13.02 - Describe the architecture, reporting styles, evolution, and benefits of business intelligence | |

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| 25. \_\_\_\_\_ tools focus on the strategic and tactical use of information.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | Business | b. | Relational database management | |  | c. | Business intelligence | d. | Networking |  |  |  | | --- | --- | | *ANSWER:* | c | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-2a Business Intelligence Architecture | | *LEARNING OBJECTIVES:* | 13.02 - Describe the architecture, reporting styles, evolution, and benefits of business intelligence | |

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| 26. Which of the following is a personal analytics vendor for BI applications?   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | IBM | b. | Kognitio | |  | c. | Netezza | d. | MicroStrategy |  |  |  | | --- | --- | | *ANSWER:* | d | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-2d Business Intelligence Technology Trends | | *LEARNING OBJECTIVES:* | 13.02 - Describe the architecture, reporting styles, evolution, and benefits of business intelligence | |

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| 27. From a data analyst’s point of view, decision support data differ from operational data in three main areas: time span, granularity, and \_\_\_\_\_.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | usability | b. | dimensionality | |  | c. | transaction processing | d. | sparsity |  |  |  | | --- | --- | | *ANSWER:* | b | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-3a Operational Data versus Decision Support Data | | *LEARNING OBJECTIVES:* | 13.03 - Differentiate between operational data and decision support data | |

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| 28. Operational data are commonly stored in many tables, and the stored data represents information about a given \_\_\_\_\_ only.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | transaction | b. | database | |  | c. | table | d. | concept |  |  |  | | --- | --- | | *ANSWER:* | a | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-3a Operational Data versus Decision Support Data | | *LEARNING OBJECTIVES:* | 13.03 - Differentiate between operational data and decision support data | |

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| 29. The \_\_\_\_\_ schema must support complex (non-normalized) data representations.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | snowflake | b. | online analytical processing | |  | c. | decision support database | d. | multidimensional database |  |  |  | | --- | --- | | *ANSWER:* | c | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-3b Decision Support Database Requirements | | *LEARNING OBJECTIVES:* | 13.03 - Differentiate between operational data and decision support data | |

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| 30. Data \_\_\_\_\_ implies that all business entities, data elements, data characteristics, and business metrics are described in the same way throughout the enterprise.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | visualization | b. | analytics | |  | c. | mining | d. | integration |  |  |  | | --- | --- | | *ANSWER:* | d | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-4 The Data Warehouse | | *LEARNING OBJECTIVES:* | 13.04 - Identify the purpose, characteristics, and components of a data warehouse | |

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| 31. \_\_\_\_\_ can serve as a test vehicle for companies exploring the potential benefits of data warehouses.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | Data networks | b. | Data marts | |  | c. | Data cubes | d. | OLAPs |  |  |  | | --- | --- | | *ANSWER:* | b | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-4a Data Marts | | *LEARNING OBJECTIVES:* | 13.04 - Identify the purpose, characteristics, and components of a data warehouse | |

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| 32. Bill Inmon and Chuck Kelley created a set of 12 rules to define a(n) \_\_\_\_\_.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | data warehouse | b. | multidimensional cube | |  | c. | OLAP tool | d. | star schema |  |  |  | | --- | --- | | *ANSWER:* | a | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-4b Twelve Rules That Define a Data Warehouse | | *LEARNING OBJECTIVES:* | 13.04 - Identify the purpose, characteristics, and components of a data warehouse | |

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| 33. The basic star schema has four components: facts, \_\_\_\_\_, attributes, and attribute hierarchies.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | keys | b. | relationships | |  | c. | cubes | d. | dimensions |  |  |  | | --- | --- | | *ANSWER:* | d | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-5 Star Schemas | | *LEARNING OBJECTIVES:* | 13.05 - Develop star and snowflake schemas for decision-making purposes | |

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| 34. Computed or derived facts, at run time, are sometimes called \_\_\_\_\_ to differentiate them from stored facts.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | schemas | b. | attributes | |  | c. | metrics | d. | dimensions |  |  |  | | --- | --- | | *ANSWER:* | c | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-5a Facts | | *LEARNING OBJECTIVES:* | 13.05 - Develop star and snowflake schemas for decision-making purposes | |

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| 35. In a star schema, attributes are often used to search, filter, or classify \_\_\_\_\_.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | tables | b. | sales | |  | c. | facts | d. | dimensions |  |  |  | | --- | --- | | *ANSWER:* | c | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-5c Attributes | | *LEARNING OBJECTIVES:* | 13.05 - Develop star and snowflake schemas for decision-making purposes | |

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| 36. The attribute hierarchy provides a top-down data organization that is used for two main purposes: \_\_\_\_\_ and drill-down/roll-up data analysis.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | decomposition | b. | de-normalization | |  | c. | normalization | d. | aggregation |  |  |  | | --- | --- | | *ANSWER:* | d | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-5d Attribute Hierarchies | | *LEARNING OBJECTIVES:* | 13.05 - Develop star and snowflake schemas for decision-making purposes | |

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| 37. In star schema representation, a fact table is related to each dimension table in a \_\_\_\_\_ relationship.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | many-to-one (M:1) | b. | many-to-many (M:M) | |  | c. | one-to many (1:M) | d. | one-to-one (1:1) |  |  |  | | --- | --- | | *ANSWER:* | a | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-5e Star Schema Representation | | *LEARNING OBJECTIVES:* | 13.05 - Develop star and snowflake schemas for decision-making purposes | |

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| 38. Fact and dimension tables are related by \_\_\_\_\_ keys.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | shared | b. | primary | |  | c. | foreign | d. | linked |  |  |  | | --- | --- | | *ANSWER:* | c | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-5e Star Schema Representation | | *LEARNING OBJECTIVES:* | 13.05 - Develop star and snowflake schemas for decision-making purposes | |

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| 39. In a typical star schema, each dimension record is related to thousands of \_\_\_\_\_ records.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | attribute | b. | fact | |  | c. | key | d. | primary |  |  |  | | --- | --- | | *ANSWER:* | b | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-5e Star Schema Representation | | *LEARNING OBJECTIVES:* | 13.05 - Develop star and snowflake schemas for decision-making purposes | |

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| 40. A \_\_\_\_\_ schema is a type of star schema in which dimension tables can have their own dimension tables.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | snowflake | b. | starflake | |  | c. | dimension | d. | matrix |  |  |  | | --- | --- | | *ANSWER:* | a | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-5f Performance-Improving Techniques for the Star Schema | | *LEARNING OBJECTIVES:* | 13.05 - Develop star and snowflake schemas for decision-making purposes | |

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| 41. \_\_\_\_\_ splits a table into subsets of rows or columns and places the subsets close to the client computer to improve data access time.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | Normalization | b. | Meta modeling | |  | c. | Replication | d. | Partitioning |  |  |  | | --- | --- | | *ANSWER:* | d | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-5f Performance-Improving Techniques for the Star Schema | | *LEARNING OBJECTIVES:* | 13.05 - Develop star and snowflake schemas for decision-making purposes | |

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| 42. The reliance on \_\_\_\_\_ as the design methodology for relational databases is seen as a stumbling block to its use in OLAP systems.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | normalization | b. | denormalization | |  | c. | star schema | d. | multidimensional schema |  |  |  | | --- | --- | | *ANSWER:* | a | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-6e Relational OLAP | | *LEARNING OBJECTIVES:* | 13.07 - Describe the role and functions of data analytics and data mining | |

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| 43. Decision support data tends to be non-normalized, \_\_\_\_\_, and pre-aggregated.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | unique | b. | duplicated | |  | c. | optimized | d. | sorted |  |  |  | | --- | --- | | *ANSWER:* | b | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-6e Relational OLAP | | *LEARNING OBJECTIVES:* | 13.07 - Describe the role and functions of data analytics and data mining | |

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| 44. \_\_\_\_\_ extends SQL so that it can differentiate between access requirements for data warehouse data and operational data.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | ROLAP | b. | OLAP | |  | c. | DBMS | d. | BI |  |  |  | | --- | --- | | *ANSWER:* | a | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-6e Relational OLAP | | *LEARNING OBJECTIVES:* | 13.07 - Describe the role and functions of data analytics and data mining | |

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| 45. A \_\_\_\_\_ index is based on 0 and 1 bits to represent a given condition.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | logical | b. | multidimensional | |  | c. | normal | d. | bitmapped |  |  |  | | --- | --- | | *ANSWER:* | d | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-6e Relational OLAP | | *LEARNING OBJECTIVES:* | 13.07 - Describe the role and functions of data analytics and data mining | |

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| 46. Conceptually, MDBMS end users visualize the stored data as a three-dimensional cube known as a \_\_\_\_\_.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | multi-cube | b. | database cube | |  | c. | data cube | d. | hyper cube |  |  |  | | --- | --- | | *ANSWER:* | c | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-6f Multidimensional OLAP | | *LEARNING OBJECTIVES:* | 13.07 - Describe the role and functions of data analytics and data mining | |

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| 47. An multidimensional database management systems (MDBMS) uses proprietary techniques to store data in \_\_\_\_\_ n-dimensional arrays.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | table-like | b. | matrix-like | |  | c. | network-like | d. | cube-like |  |  |  | | --- | --- | | *ANSWER:* | b | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-6f Multidimensional OLAP | | *LEARNING OBJECTIVES:* | 13.07 - Describe the role and functions of data analytics and data mining | |

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| 48. A \_\_\_\_\_ is a dynamic table that not only contains the SQL query command to generate the rows, but also stores the actual rows.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | SQL view | b. | materialized view | |  | c. | star schema | d. | data cube |  |  |  | | --- | --- | | *ANSWER:* | b | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-8c Materialized Views | | *LEARNING OBJECTIVES:* | 13.09 - Define data visualization and explain how it supports business intelligence | |

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| 49. Data visualization has its roots in the \_\_\_\_\_ sciences, which focus on how the human brain receives, interprets, organizes, and processes information.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | cognitive | b. | developmental | |  | c. | social | d. | health |  |  |  | | --- | --- | | *ANSWER:* | a | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-9b The Science of Data Visualization | | *LEARNING OBJECTIVES:* | 13.09 - Define data visualization and explain how it supports business intelligence | |

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| 50. Which type of data describes numeric facts or measures that can be can be counted, ordered, and aggregated?   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | qualitative | b. | ordinal | |  | c. | nominal | d. | quantitative |  |  |  | | --- | --- | | *ANSWER:* | d | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-9c Understanding the Data | | *LEARNING OBJECTIVES:* | 13.09 - Define data visualization and explain how it supports business intelligence | |

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| 51. \_\_\_\_\_ is a term used to describe a comprehensive, cohesive, and integrated set of tools and processes used to capture, collect, integrate, store, and analyze data with the purpose of generating and presenting information used to support business decision making.   |  |  | | --- | --- | | *ANSWER:* | Business intelligence | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-2 Business Intelligence | | *LEARNING OBJECTIVES:* | 13.02 - Describe the architecture, reporting styles, evolution, and benefits of business intelligence | |

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| 52. \_\_\_\_\_ functionality ranges from simple data gathering and transformation to very complex data analysis and presentation.   |  |  | | --- | --- | | *ANSWER:* | BI  business intelligence | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-2a Business Intelligence Architecture | | *LEARNING OBJECTIVES:* | 13.02 - Describe the architecture, reporting styles, evolution, and benefits of business intelligence | |

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| 53. **\_\_\_\_\_** use web-based technologies to present key business performance indicators or information in a single integrated view, generally using graphics in a clear, concise, and easy to understand manner.   |  |  | | --- | --- | | *ANSWER:* | Dashboards | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-2a Business Intelligence Architecture | | *LEARNING OBJECTIVES:* | 13.02 - Describe the architecture, reporting styles, evolution, and benefits of business intelligence | |

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| 54. Data **\_\_\_\_\_** tools are tools that provide advanced statistical analysis to uncover problems and opportunities hidden within business data.   |  |  | | --- | --- | | *ANSWER:* | mining | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-2a Business Intelligence Architecture | | *LEARNING OBJECTIVES:* | 13.02 - Describe the architecture, reporting styles, evolution, and benefits of business intelligence | |

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| 55. **\_\_\_\_\_** are quantifiable measurements (numeric or scale based) that assess a company’s effectiveness or success in reaching its strategic and operational goals.   |  |  | | --- | --- | | *ANSWER:* | Key performance indicators  KPI  KPIs  Key performance indicators (KPI) | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-2a Business Intelligence Architecture | | *LEARNING OBJECTIVES:* | 13.02 - Describe the architecture, reporting styles, evolution, and benefits of business intelligence | |

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| 56. \_\_\_\_\_ is a collection of concepts, techniques, and processes for the proper identification, definition, and management of data elements within an organization.   |  |  | | --- | --- | | *ANSWER:* | Master data management  MDM  Master data management (MDM) | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-2a Business Intelligence Architecture | | *LEARNING OBJECTIVES:* | 13.02 - Describe the architecture, reporting styles, evolution, and benefits of business intelligence | |

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| 57. \_\_\_\_\_\_ is a method or process of government.   |  |  | | --- | --- | | *ANSWER:* | Governance | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-2a Business Intelligence Architecture | | *LEARNING OBJECTIVES:* | 13.02 - Describe the architecture, reporting styles, evolution, and benefits of business intelligence | |

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| 58. \_\_\_\_\_  means to decompose data into more atomic components or data at lower levels of aggregation.   |  |  | | --- | --- | | *ANSWER:* | Drill down | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-3a Operational Data versus Decision Support Data | | *LEARNING OBJECTIVES:* | 13.03 - Differentiate between operational data and decision support data | |

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| 59. To support a(n) **\_\_\_\_\_** adequately, the DBMS might be required to support advanced storage technologies, and even more importantly, to support multiple-processor technologies, such as a symmetric multiprocessor (SMP) or a massively parallel processor (MPP).   |  |  | | --- | --- | | *ANSWER:* | VLDB  very large database  very large database (VLDB) | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 13-3b Decision Support Database Requirements | | *LEARNING OBJECTIVES:* | 13.03 - Differentiate between operational data and decision support data | |

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| 60. A(n)\_\_\_\_\_ is a read-only database optimized for data analysis and query processing.   |  |  | | --- | --- | | *ANSWER:* | data warehouse | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-4 The Data Warehouse | | *LEARNING OBJECTIVES:* | 13.04 - Identify the purpose, characteristics, and components of a data warehouse | |

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| 61. A data **\_\_\_\_\_** is a centralized, consolidated database that integrates data derived from the entire organization and from multiple sources with diverse formats.   |  |  | | --- | --- | | *ANSWER:* | warehouse | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-4 The Data Warehouse | | *LEARNING OBJECTIVES:* | 13.04 - Identify the purpose, characteristics, and components of a data warehouse | |

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| 62. A data **\_\_\_\_\_** is a small, single-subject data warehouse subset that provides decision support to a small group of people.   |  |  | | --- | --- | | *ANSWER:* | mart | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-4a Data Marts | | *LEARNING OBJECTIVES:* | 13.04 - Identify the purpose, characteristics, and components of a data warehouse | |

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| 63. **\_\_\_\_\_** are numeric measurements (values) that represent a specific business aspect or activity.   |  |  | | --- | --- | | *ANSWER:* | Facts | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-5a Facts | | *LEARNING OBJECTIVES:* | 13.05 - Develop star and snowflake schemas for decision-making purposes | |

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| 64. **\_\_\_\_\_** are qualifying characteristics that provide additional perspectives to a given fact.   |  |  | | --- | --- | | *ANSWER:* | Dimensions | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-5b Dimensions | | *LEARNING OBJECTIVES:* | 13.05 - Develop star and snowflake schemas for decision-making purposes | |

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| 65. In multidimensional terms, the ability to focus on slices of the cube to perform a more detailed analysis is known as **\_\_\_\_\_**.   |  |  | | --- | --- | | *ANSWER:* | slice and dice | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-5c Attributes | | *LEARNING OBJECTIVES:* | 13.05 - Develop star and snowflake schemas for decision-making purposes | |

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| 66. The \_\_\_\_\_ hierarchy provides a top-down data organization that is used for two main purposes: aggregation and drill-down/roll-up data analysis.   |  |  | | --- | --- | | *ANSWER:* | attribute | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-5d Attribute Hierarchies | | *LEARNING OBJECTIVES:* | 13.05 - Develop star and snowflake schemas for decision-making purposes | |

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| 67. **\_\_\_\_\_** makes a copy of a table and places it in a different location to improve access time.   |  |  | | --- | --- | | *ANSWER:* | Replication | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-5f Performance-Improving Techniques for the Star Schema | | *LEARNING OBJECTIVES:* | 13.05 - Develop star and snowflake schemas for decision-making purposes | |

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| 68. The most distinctive characteristic of modern OLAP tools is their capacity for **\_\_\_\_\_** analysis.   |  |  | | --- | --- | | *ANSWER:* | multidimensional | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-6a Multidimensional Data Analysis Techniques | | *LEARNING OBJECTIVES:* | 13.07 - Describe the role and functions of data analytics and data mining | |

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| 69. To deliver efficient decision support, OLAP tools must have advanced data \_\_\_\_\_ features.   |  |  | | --- | --- | | *ANSWER:* | access | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-6b Advanced Database Support | | *LEARNING OBJECTIVES:* | 13.07 - Describe the role and functions of data analytics and data mining | |

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| 70. **\_\_\_\_\_** is a measurement of the density of the data held in the data cube and is computed by dividing the total number of actual values in the cube by the total number of cells in the cube.   |  |  | | --- | --- | | *ANSWER:* | Sparsity | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 13-6f Multidimensional OLAP | | *LEARNING OBJECTIVES:* | 13.07 - Describe the role and functions of data analytics and data mining | |

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| 71. What is the difference between decision support data and operational data from the point of view of data analyst?   |  |  | | --- | --- | | *ANSWER:* | From a data analyst’s point of view, decision support data differ from operational data in three main areas: time span, granularity, and dimensionality.  Time span: Operational data cover a short time frame. In contrast, decision support data tend to cover a longer time frame. Granularity (level of aggregation): Decision support data must be presented at different levels of aggregation, from highly summarized to nearly atomic. Dimensionality: Operational data focus on representing individual transactions rather than the effects of the transactions over time. In contrast, data analysts tend to include many data dimensions and are interested in how the data relate over those dimensions. | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 13-3a Operational Data versus Decision Support Data | | *LEARNING OBJECTIVES:* | 13.03 - Differentiate between operational data and decision support data | |

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| 72. Describe the use of SQL in relation to ROLAP.   |  |  | | --- | --- | | *ANSWER:* | Most decision support data requests require the use of multiple-pass SQL queries or multiple nested SQL statements. To answer this criticism, ROLAP extends SQL so that it can differentiate between access requirements for data warehouse data (based on the star schema) and operational data (normalized tables). A ROLAP system therefore can generate the SQL code required to access the star schema data. Query performance is also improved because the query optimizer is modified to identify the SQL code’s intended query targets. For example, if the query target is the data warehouse, the optimizer passes the requests to the data warehouse. However, if the end user performs drill-down queries against operational data, the query optimizer identifies that operation and properly optimizes the SQL requests before passing them to the operational DBMS. | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 13-6e Relational OLAP | | *LEARNING OBJECTIVES:* | 13.08 - Explain how SQL analytic functions are used to support data analytics | |

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| 73. What is the ROLLUP extension to the GROUP BY clause? Provide the syntax for this extension.   |  |  | | --- | --- | | *ANSWER:* | The ROLLUP extension is used with the GROUP BY clause to generate aggregates by different dimensions. As you know, the GROUP BY clause will generate only one aggregate for each new value combination of attributes listed in the GROUP BY clause. The ROLLUP extension goes one step further; it enables you to get a subtotal for each column listed except for the last one, which gets a grand total instead. The syntax of the GROUP BY ROLLUP command sequence is as follows:  SELECT column1 [, column2, ...], aggregate\_function(expression)  FROM table1 [, table2, …]  [WHERE condition]  GROUP BY ROLLUP (column1 [, column2, ...])  [HAVING condition]  [ORDER BY column1 [, column2, …]] | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 13-8a The ROLLUP Extension | | *LEARNING OBJECTIVES:* | 13.08 - Explain how SQL analytic functions are used to support data analytics | |

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| 74. What is data visualization? Name different techniques of data visualization.   |  |  | | --- | --- | | *ANSWER:* | Data visualization is the abstracting of data to provide information in a visual format that enhances a user's ability to effectively comprehend the meaning of the data. The goal of data visualization is to allow the user to see the big picture in the most efficient way possible. Data visualization aggregates the data into a format that provides at-a-glance insight into overall trends and patterns. Data visualization techniques, that can range from simple to very complex, include pie charts, line graphs, bar charts, scatter plots, gantt charts, and heat maps. | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 13-9 Data Visualization | | *LEARNING OBJECTIVES:* | 13.09 - Define data visualization and explain how it supports business intelligence | |

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| 75. Before you start with data visualization, you must understand the data. The same data can be presented in multiple ways. Explain the two types of data.   |  |  | | --- | --- | | *ANSWER:* | In general, there are two types of data:  ​  Qualitative: describes qualities of the data. This type of data can be subdivided in two subtypes:   * Nominal: This is data that can be counted but not ordered or aggregated. Examples: sex (male or female); student class (graduate or undergraduate). * Ordinal: This is data that can be counted and ordered but not aggregated. Examples: rate your teacher (excellent, good, fair, poor), what is your family income (under 20,000, 20,001 to 40,000, 40,001 to 60,000, 60,001 or more).   ​  Quantitative: describes numeric facts or measures of the data. This type of data can be counted, ordered and aggregated. Statisticians refer to this data as “interval and ratio” data. Examples of quantitative data include age, GPA, number of accidents, etc. | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 13-9c Understanding the Data | | *LEARNING OBJECTIVES:* | 13.09 - Define data visualization and explain how it supports business intelligence | |