BUSINESS INTELLIGENCE AND ANALYTICS

ASSIGNMENT WEEK 3:

Total marks = (15 Qns * 1 mark = 15 marks)

1. Which database schema is typically associated with OLAP systems? (1 Mark)
   a) Entity-Relationship (ER) schema
   b) Star or Snowflake schema
   c) Relational schema
   d) Object-oriented schema

   Answer: b) Star or Snowflake schema

2. In a data cube, what are dimensions primarily representing? (1 Mark)
   a) Numeric measures
   b) Facts related to sales
   c) Entities or perspectives for record-keeping
   d) Tables associated with facts

   Answer: c) Entities or perspectives for record-keeping

3. What metaphor is used to describe multidimensional data storage in data warehousing? (1 Mark)
   a) Lattice
   b) Apex cuboid
   c) Data cube
   d) Base cuboid
   Answer: c) Data cube

4. What does the apex cuboid in a data cube typically represent? (1 Mark)
   a) Lowest level of summarization
   b) Highest level of summarization
   c) Total sales or dollars sold
   d) Entities or perspectives for record-keeping

   Answer: b) Highest level of summarization

5. How many cuboids are there in a 4-dimensional cube with 4 levels each? (1 Mark)
   a) 625 cuboids
   b) 725 cuboids
   c) 125 cuboids
   d) 525 cuboids

   Ans: a. 625 cuboids

6. What is a significant difference between a snowflake schema and a star schema? (1 Mark)

a) Higher redundancy in dimension tables

b) Increased efficiency in querying

c) Normalization of dimension tables

d) Dimension tables linked directly to the fact table

Answer: c) Normalization of dimension tables

7. Which schema is commonly used in data warehouses due to its capability to model multiple, interrelated subjects? (1 Mark)
   a) Star schema
   b) Snowflake schema
   c) Fact constellation
   d) Entity-relationship model

   Answer: c) Fact constellation

8. Which normal form deals with atomicity and ensures that each attribute contains only indivisible values? (1 Mark)
   a) First Normal Form (1NF)
   b) Second Normal Form (2NF)
   c) Third Normal Form (3NF)
   d) Boyce-Codd Normal Form (BCNF)

   Answer: A) First Normal Form (1NF)

9. In a relational database, what is the purpose of a foreign key? (1 Mark)
   a) It uniquely identifies each record in a table.
   b) It maintains referential integrity between tables.
   c) It ensures all attributes are atomic.
   d) It acts as a substitute for the primary key.

   Answer: B) It maintains referential integrity between tables.

10. Consider the SQL statement: SELECT COUNT (*) FROM table_name. What does it retrieve? (1 Mark)

    a) All entries with * in the table

    b) The number of unique values in the table

    c) All rows in the table

    d) The average value across all columns

    Answer: c) All rows in the table

11. What is the primary objective of normalizing a database? (1 Mark)
    a) To eliminate data redundancy and minimize data inconsistency

b) To increase data duplication for faster retrieval
c) To combine tables for simplification
d) To allow for more complex queries

Answer: A) To eliminate data redundancy and minimize data inconsistency

12. Which normalization form ensures that every non-prime attribute is fully functionally dependent on the primary key, eliminating all transitive dependencies? (1 Mark)
    a) Second Normal Form (2NF)
    b) Third Normal Form (3NF)
    c) Boyce-Codd Normal Form (BCNF)
    d) Fourth Normal Form (4NF)

    Answer: C) Boyce-Codd Normal Form (BCNF)

13. What is the purpose of generating a lattice of cuboids in a data cube model? (1 Mark)
    a) To display data at various levels of summarization based on different dimensions
    b) To limit data visualization to a three-dimensional representation
    c) To establish a relationship between the number of dimensions and the quantity of facts
    d) To organize data in a hierarchical manner for easier access

    Answer: A) To display data at various levels of summarization based on different dimensions.

14. What distinguishes a data mart from a data warehouse in terms of schema preference? (1 Mark)

a) Data marts prioritize the fact constellation schema, whereas data warehouses prefer snowflake schemas.
b) Data warehouses commonly employ star schema, while data marts usually opt for snowflake schemas.
c) Data marts typically utilize star or snowflake schemas, while data warehouses Favor the fact constellation schema.
d) Data warehouses exclusively use star schemas, whereas data marts solely rely on snowflake schemas.

Answer: C) Data marts typically utilize star or snowflake schemas, while data warehouses favour the fact constellation schema.

15. What characterizes the Roll-up operation in OLAP? (1 Mark)

a) It aggregates data by stepping up a concept hierarchy or by adding dimensions.
b) It drills down into more detailed data by ascending a concept hierarchy.
c) It removes one or more dimensions from the cube, reducing its granularity.
d) It visualizes data by rotating the axes to provide an alternative presentation.

Answer: A) It aggregates data by stepping up a concept hierarchy or by adding dimensions.